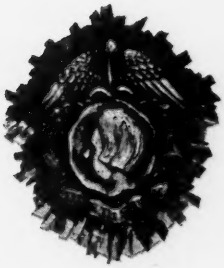
Journal of Dentistry for Children



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CONSTITUTION AND BY-LAWS

FOURTH QUARTER 1949

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The Banded-Amalgam-Crown

MAURY MASSLER, D.D.S., M.S.
Chicago, Illinois
and
JOHN M. FRANKEL, D.D.S.
Milwaukee, Wis.

Editor's Note:

We are always pleased to publish papers of practical value to our readers, such as the accompanying one by Maury Massler, Professor of Graduate Pedodontics at the University of Illinois School of Dentistry, and John M. Frankel, Head of the new Departments of Pedodontics and Dental Hygiene of Marquette University School of Dentistry, who recently completed two years of Graduate work in Pedodontics with Maury, after his return from an extended tour of duty with the Army. John is doing a nice job at Marquette, encouraged by his predecessor George Morgan and the acting Dean, Ossie Dresen, who has promised an all-out effort to establish a new Children's Clinic at that school.

A.E.S.

Introduction

Dental service for the younger age groups too often consists only of the extraction of badly carious primary and young permanent teeth. This is predicated on the fact that the restoration of a badly carious tooth is time-consuming and therefore costly to both the dentist and the patient. Some of the teeth thus lost by extraction might be retained if there were available a rapid, inexpensive method of restoring them. A *partial* answer to this need is to be found in the banded-amalgam-crown.

Indications

The banded-amalgam crown is especially useful in restoring badly broken down (carious) primary molar teeth. It is also a very useful type of restoration for primary molars in which pulpectomies or pulpotomies have been performed. Such teeth often present only a shell of enamel which is brittle and fractures easily under masticatory stresses. A banded type of restoration will support the fragile enamel and should preserve such a tooth until its normal exfoliation time.

The banded-amalgam-crown can also be used in young, partially erupted permanent bicuspids or molars (either vital or pulpless) which have been badly destroyed by caries, and in which it is impractical or contraindicated to use the usual type of cast gold crown restoration.

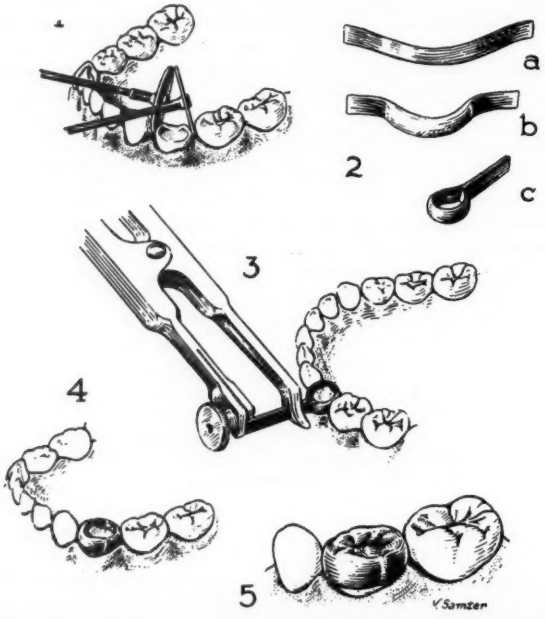
Material

The materials needed for this type of restoration are minimal: 5/32″ x .005″ temperable gold band material, solder and the usual amalgam. Preformed, ready made gold or stainless steel bands may be used but they do not give the fine adaptation at the gingival margin that is possible with the pinched band.

Technic

1. All caries is excavated and the pulpal floor is covered with zinc oxide and eugenol paste and/or cement as indicated. A base should always be used for pulp protection in vital teeth.
2. Disc the proximal contact areas. Only the proximal surfaces need to be prepared to remove gross undercuts and provide room for the band (Figure 1). If caries has destroyed the proximal contact areas, removal of the decayed tooth structure is all the preparation that is necessary. If contact has occurred at the cervical area by drifting, separation by brass ligatures will suffice to provide room for the band at the proximal cervical area.

3. The band material is contoured with any contouring plier so that it will form a barrel-shaped band instead of a flat sided cylinder (Figure 2).
4. The band is carefully adapted around the tooth using any standard band-pinching plier. The Angle band-forming pliers (No. 155) are very satisfactory. Contour the gingival margin of the band if necessary. Make sure that the band fits snugly around the entire circumference of the tooth.
5. The band is soldered.
6. The occlusal height of the band is trimmed to the level of the marginal ridges as this gives support to the weakest area of the amalgam. When viewed from the occlusal, the band should outline the "occlusal table" of the tooth.
7. The soldered band is re-contoured, especially at the contact areas, to simulate the proximal contours of the original tooth (Figure 4).
8. The gingival margin of the band is feathered to a knife edge using a gold file or sandpaper disc. Test the gingival adaptation of the band carefully. The band is cleaned by pickling in acid and then polished.
9. The band is cemented into place. Burnish the gingival margin carefully. The excess cement on the inside of the band may be packed down to act as a cement base. All cement on the outside of the band should be removed. An explorer is used to search for any cement that may be trapped under the gingivae. With the explorer also carefully test the gingival fit of the band and make sure no overhang occurs. If an overhang is found, the band can easily be removed, re-contoured and re-cemented.
10. Amalgam is packed into the band and built to the occlusal level. The occlusal table is carved as in any amalgam restoration. (See Figure 5).
11. The amalgam portion of the crown is polished at a subsequent sitting.



Advantages of the Banded-Amalgam-Crown

The banded-amalgam-crown is a rapid and inexpensive method of restoring badly broken down teeth which otherwise would have to be extracted. It makes possible the restoration and preservation of pulpless teeth which otherwise would fracture under occlusal stresses. The band reinforces the exterior while the amalgam supports the interior of the thin enamel wall even in the absence of adequate dentin support.

Restoration by a full cast crown requires a considerable amount of time for tooth preparation to remove all undercuts in order to prepare the wax pattern. This, in addition to the considerable amount of laboratory time involved in precise casting techniques, often makes this type of restoration impractical for use in pedodontic practice.

The banded-amalgam-crown requires only minimal tooth preparation since the pinched band is flexible and will slip easily over minor curvatures of the tooth. Only the bell-shaped, proximal undercuts need be eliminated. This results in considerable saving of chair time. In addition, since the band can be pinched, contoured and soldered in a few minutes, all laboratory time is eliminated. The entire restoration can easily be completed in one average sitting.

The banded-crown is superior to any preformed or "shell" crown in that the fit at the gingival margin is much more exact and therefore much less injurious to the gingival tissue. The gingival fit of the pinched-band-crown closely approaches the gingival fit of the cast gold crown with a soldered periphery (Tylman, 1947).

Discussion

Despite the use of both silver and gold in the same restoration, the danger of galvanism is minimized by the close approximation of the two metals. According to Reed (1940), the intimate and continuous contact of the two metals would result in a drop in the electromotive force within 24 to 48 hours.

A cast gold occlusal surface or even the occlusal portion of a preformed gold crown can be used in place of the amalgam for the restoration of young permanent molars or bicuspids. In either case the occlusal portion is carried over the occlusal third of the adapted band and soldered to it. Such restorations are superior to the preformed "shell" crown of the more accurate fit at the gingival.

Summary

1. There exists a great need for a rapid, inexpensive method of restoring badly carious teeth in children.

2. A technique for the construction of a banded-amalgam-crown to restore badly carious primary and young permanent molars in children is presented.

3. It is rapid, inexpensive and permits the restoration of badly broken down (carious) molars and bicuspids which might otherwise have to be extracted.

REFERENCES

Brodie, A. G.
Technique of the Pinch-Band.
Angle Orthod. 2:260-269 (Oct.) 1932.

Reed, G. J. and Willman, M.
Galvanism in the Oral Cavity.
J.A.D.A. 27:1471 (Sept.) 1940.

Tylman, S. G.
Crown and Bridge Prosthesis.
C. V. Mosby Co., St. Louis, 1947, pp. 566-590

New Zealand School Dental Service in Operation

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Editors' Notes:

Dr. Marshall-Day was born in New Zealand where he received a dental degree at Otago University. In 1926-27 he attended the Harvard University Dental School and was awarded the degree of Doctor of Dental Medicine. He then went to the University of Rochester on a Rockefeller Foundation Research Fellowship and did graduate work for the Master of Science degree. At Rochester he collaborated with Sedwick showing conclusively that the use of Vitamin A and D supplements had no appreciable effect on caries incidence. In 1936 he was appointed dean of the dental college at the University of Punjab in India. While in India he further demonstrated by clinical studies that malnutrition is not an important factor in caries incidence since his studies revealed that among the large numbers of children who lived on deficient diets, the caries incidence was remarkably low. He also made observations on the frequency of periodontal disturbances in the general population of Indians in the Punjab areas.

We are indeed pleased to present this paper to our readers.

M.M.C.

In view of the recently inaugurated program for the training of female personnel to prepare and fill cavities in the teeth of children mentioned in this paper, this article is of import to every dentist in the United States. Do we hear some of you, ostrich-like, saying "It can't happen here?!"

A.E.S.

Just as A. C. Fones, of Bridgeport, Connecticut, was an enthusiast who fathered a movement (the inauguration of the dental hygienist system in the United States), so also was Thomas A. Hunter of Wellington, New Zealand, an enthusiastic pioneer in the field of public health dentistry. Thomas A. Hunter (now Sir Thomas Hunter) was the man responsible for the inauguration of the New Zealand School Dental Service. He returned from World War I as Colonel commanding the New Zealand Army Dental Corps, already well aware from his previous experience in private practice and later in the Army, of the high caries attack rate in that country, and imbued with a somewhat revolutionary idea for coping with a seemingly hopeless situation aggravated by a serious inadequacy in professional personnel. Whether we agree wholly, or in part, or not at all with Hunter's ideas and the procedures he advocated, we cannot help but admire his courage and tenacity in pushing through the necessary legislation and finally establishing the system in the face of the most determined opposition from an overwhelming majority of the dental profession at that time. With this stormy beginning and after an exceedingly rough passage through the legislature a bill was finally enacted and placed on the Statute Book authorizing the training and employment of ancillary personnel in the New Zealand School Dental Service. The trainee was given the title of "School Dental Nurse" and in no instance has ever been employed outside the school dental service. There has never been a case of attempted infringement of the conditions laid down for her employment in government service only, and none has ever been employed in private practice. The term "School Dental Nurse" is somewhat unfortunate and rather confusing, since she is not a trained dental nurse in the true sense of the term, nor is she a dental hygienist. Probably the term "nurse-practitioner" or the still more unwieldy desig-

nation of "hygienist-practitioner" would best describe the scope of her activities. The New Zealand school dental nurse represents a type of ancillary personnel who has had an intensive training within a restricted field of practice upon a limited section of the population, namely, school children.

The New Zealand National Dental Service functions as the Division of Dental Hygiene in the Department of Health. It is organized in two sections, the School Dental Service and the recently established Adolescent Dental Service. The School Dental Service was established in 1919, not under a Labor or Socialist Government as is commonly believed in this country, but under a Conservative Government with liberal ideas. The Adolescent Dental Service was inaugurated on a restricted basis as recently as 1947. The school dental nurse is not concerned with the Adolescent Service, her activities being limited entirely to the school and pre-school age groups from 2½-13 years.

The combined service is under the control of the Director of the Dental Division of the Department of Health (himself a dental-surgeon) who in turn is responsible to the Minister of Health through the Director-General of Health. The Director is assisted by a Deputy-Director, an Assistant Director (in charge of training) and a Principal Dental Officer (in charge of dental health education). The service is organized in eight units, each of which is controlled by a Senior Dental Officer, who is directly responsible to the Director. These eight officers are respectively the Principal of the Dominion Training School for Dental Nurses and the Principal Dental Officers in charge of the seven dental districts into which the Dominion is organized.

The Principal of the Dominion Training School for Dental Nurses is responsible for the training of the school dental nurses and also for the efficient operation as a public institution of the Children's Dental Clinic which is an integral part of the Training School. At present 200 dental nurses are in training. Each dental officer in charge of a district is responsible to the Director for the establishment, maintenance, and efficient operation of the adolescent and school dental clinics in his district in accordance with the policy laid down by the Department.

New Zealand is fortunate in being a young and virile country with a compartively small population of less than two million and, therefore, serves as an excellent testing ground for applying the ideas of other countries and also for putting into practice original ideas for the benefit of the community. The school dental nurse system is one of these original ideas peculiar to New Zealand and not yet adopted by any other country. It is generally recognized also that New Zealand has always been in the forefront in infant and maternity welfare service, which is reflected in the extremely low infant and maternal mortality rates and in the world's highest figures for expectation of life.

The stated functions of the New Zealand School Dental Service are (a) to improve the standard of dental health of school children and of pre-school children from 2½ years of age by affording them regular and systematic treatment at six-month intervals over a period of years. Treatment is begun on entering the primer classes (and earlier wherever possible) and is continued to Standard VI of primary schools or equivalent to the corresponding grade at age 12-13 years in this country; (b) to instruct children in the principles of oral hygiene and the preservation of the teeth. For this purpose there is within the Dental Division an active organization for dental health education.

The School Dental Service is staffed by school dental nurses trained within the Department of Health and working under the supervision and direction of dental officers of this department.

In the selection of candidates for training, education, health and personality are all taken into consideration. Competition is keen and consequently it is possible to maintain a high standard in the student nurses selected. Preference is given to young women who have passed the University Entrance or Matriculation Examination while the School Certificate Examination is the minimum educational requirement. A high standard of physical fitness is demanded by a special Medical Board. Chests are x-rayed as a routine procedure and special attention is paid to the feet, throat and

eyesight. Candidates must have well-cared-for natural teeth. If they fulfill these primary conditions, candidates are interviewed by a Selection Committee.

Appointees are required to enter into an agreement not to leave the service of the department during training and for at least three years after completion of training, except for reasons of ill health or dismissal. The rapid increase in the school population has recently created a personnel problem, and at present trainees enter the training institution in groups of 50 at six-month intervals, so that 100 dental nurses per annum are being appointed from the 200 in training at any one time.

In the selection of candidates special consideration is given to those who have passed in English, biology, chemistry, general science, physiology, drawing, and design, homecraft and allied subjects. Due consideration is also given to previous experience of an appropriate nature; for example, as a dental attendant, hospital aide, or kindergarten teacher. A knowledge by the applicant of first aid, life-saving, or arts and crafts is also considered an advantage. Applicants must be over seventeen years of age, but preference is given to those between the ages of eighteen and twenty-five.

During training student dental nurses, other than those whose homes are in Wellington, are required to reside in the Department hostels which are conducted in association with the Training School. A good deal of evening work is necessary throughout the two years training, and with this in view a compulsory evening silence period is observed for study purposes in the hostel. Special provisions are made for off-duty activities. The nurses have their own recreation club which organizes various sports and other activities, including a Student Dental Nurses' Choir, basketball, hockey, tennis, and swimming. A class in physical education is conducted by a specialist instructor and a good library is provided for scientific as well as general reading.

The Principal of the Dominion Training School for Dental Nurses is assisted by a staff of Dental Surgeon Instructors and Dental Tutor Sisters. For clinical operative dentistry the aim is to maintain a ratio of one instructor for every 10-12 student dental nurses.

The two-year course of training has been organized and integrated to give an adequate historical and scientific background and a comprehensive theoretical and practical training in all procedures related to the practice of dentistry for children. During the first year the student is given a brief outline of the history and development of dentistry and of the New Zealand School Dental Service, together with an outline of the history and ethics of nursing, with stress on recent developments in the preventive field of public health. The course includes a brief outline of the maternal and child welfare movement in New Zealand and abroad, of the fundamentals of child care and nutrition in the pre-natal, post-natal, and pre-school periods, concurrent with a series of visits to child-welfare organizations. A practical course including working with metals and plastic materials as well as lettering and design for poster-making is taken at a School of Art. Such courses are useful in their technical work later on and as a preparation for dental health education. This is supplemented later by a course of instruction in the application of present-day knowledge to the teaching of the prevention of dental disease. The course includes a series of lecture-demonstrations at the Teachers' Training College followed by visits to schools for observation and practice in teaching. The dental nurse is thus well-equipped at the end of her training period to take an active part in the service program of dental health education.

The student dental nurse is also taught general, personal, and institutional hygiene, sterilization, and the mechanical care of instruments and equipment. The course includes an elementary study of anatomy, physiology, dental pharmacology, and general pathology and bacteriology. Greater emphasis is placed on dental anatomy, dental pathology, and dental surgery. This would appear a very full schedule for theoretical subjects but these have been so well arranged and integrated that they are well within the capabilities of the student. Of course, modifications have been made from time to time over the past quarter of a century, in the light of earlier experience, to keep abreast of modern knowl-

edge and for the purpose of stressing the essentials and eliminating the non-essentials. Orthodontics is not practiced by the school dental nurse, but a brief outline is given of the causes of malocclusion and irregularities of the teeth so that she is able to recognize defects, in some cases to apply preventive measures, and to refer cases requiring treatment to dental surgeons and orthodontists.

Concurrent with a course of practical operative work comprising the preparation and filling of cavities in natural teeth in dummy jaws, a course of lectures and demonstrations is given in these procedures, always with special reference to children's teeth.

The second year of training is devoted mainly to operative dentistry, which is carried out in a modern and very well equipped clinic in the Training School under the supervision of the instructional staff. The treatment performed includes amalgam, cement, and silicate fillings; scaling; cleaning; silver nitrate treatment, the use of sodium fluoride; extraction of teeth under local anesthesia; and miscellaneous dental operations for children. Before completing her training, each Student Dental Nurse must fulfill certain minimum requirements in regard to the practical treatment and control of dental disease. She must also have a thorough working knowledge of the establishment and maintenance of school dental clinics, the composition and function of school dental clinic committees, cooperation with teachers and parents, and the use of official forms, correspondence, records, statistics, and reports. Students must also qualify for the senior first-aid certificate of the St. John's Ambulance Association.

In addition to class examinations, qualifying examinations are held at the end of every six months. The final examination (written, oral, and practical) is at the end of the second year, the Board of Examiners consisting of private practitioners of high standing and the Principal of the Dominion Training School.

The Student Dental Nurse is required to agree to serve for not less than five years including the two years training period. The cost of the service including the training is borne by the government, and appointments are subject to the provisions of the Public Service Act and other Acts or regulations affecting the Public Service, and salaries graded accordingly. Student Dental Nurses are paid at the rate of $600 per annum plus a lodging allowance of $160 for those living away from home. After completion of training, School Dental Nurses receive $1060 the first year, rising by annual increasements to $1500 for the fifth and subsequent years. The School Dental Nurses may also qualify for senior posts in the Service, Dental Nurse Inspectors, and Dental Tutor Sisters, on salaries of $1640-$1740. Beyond this point salary increases are not provided unless by special recommendation. Provision is made for traveling and certain other allowances. There is approximately eight weeks' holiday in the year corresponding to the school vacations.

School dental clinics are established at selected centers on the recommendation of the Principal Dental Officer of the District after consultation with a committee representing the local people. A dental Clinic Committee is set up to attend to the financial aspect and other matters of local administration. In determining which schools are to be served by a clinic, the guiding factor is that when the work is fully developed on a maintenance basis, one school dental nurse is expected to control 450-500 patients on a basis of six-monthly visits. The records kept by the school dental nurse are designed to give a complete history of the treatment of each patient and to provide a system by which the name of each patient comes to notice every six months.

School dental nurses are actually officers of the Department of Health, but they are "attached for special duty" to the staff of the school at which the clinic is situated. Thus they come under the general jurisdiction of the local headmaster, but their actual controlling officer is the Principal Dental Officer of the District.

Treatment is standardized as far as possible. No root canal therapy is undertaken. Amalgam is used for the filling of primary and permanent posterior teeth and silicate for anterior teeth. Prophylactic odontotomy has been practised as a routine procedure with marked success, and sodium fluoride treatment has been recently introduced. Where necessary, the extraction of primary and permanent teeth is carried out, under local anes-

thetic only, and each patient receives a six-monthly prophylaxis.

An active research unit functioning under the Medical Research Council and attached to the Division of Dental Hygiene has recently been inaugurated for the purpose of developing a preventive approach to the dental problem.

Health education is an important feature of the Service. As already indicated, during their training school dental nurses receive a formal course of instruction in this work, both theoretical and practical. This is augmented by post-graduate instruction, and school dental nurses undertake educational work as a regular part of their duties. The Director reports that their activities in this field are notable for enthusiasm, initiative, and originality. In a single year nearly 12,000 demonstrations and talks to parents and children have been given. It is difficult to believe that the impact of such an intensive educational program on such a comparatively small population group, supported as it is by practical dental health measures, could be anything but beneficial to the health of the youth of the community or have anything but a stimulating effect upon patient attendances in private practice.

The school dental nurse in charge of a clinic (there may be two dental nurses in a clinic, but normally not more than two) is under the direct control of the Principal Dental Officer of the District, and he or his deputy is consulted in regard to patients who present conditions which appear to require special treatment. The Principal Dental Officer visits all clinics in his district at frequent and irregular intervals to inspect the cleanliness and general appearance of the clinic and correct appearance of the school dental nurse in uniform; to check the accuracy of records and to ensure that the work does not fall into arrears; to inspect the quality of the operative work and to detect any defects that may have been overlooked, by a representative sampling of patients selected by himself for this purpose; and to maintain contact with headmasters and officials of local dental clinic committees. In this work, the Principal Dental Officer is assisted by specially selected Dental Nurse Inspectors who themselves have had long experience as School Dental Nurses.

The ultimate aim of the New Zealand National Dental Service is to provide dental service for adolescents also, adolescent treatment being considered in effect a continuation of primary and intermediate school treatment. This will be effected through the medium of a full-time salaried service of dental surgeons, but until sufficient dental surgeons are available to staff such a service, private practitioners are carrying out the work on a fee-for-service basis. For the present, the maximum age has been fixed as the sixteenth birthday. It is intended that the age will be raised year by year until the patient has reached his nineteenth birthday, according to the capacity of the Department to absorb the additional age groups. This interim (private practitioner) service for adolescents provides for a free choice of dentists, and dentists have the right to decline patients. Dentists are free to carry out all forms of treatment normally given in a good conservative practice. It is interesting to note that no provision is made in the normal schedule of treatment for extractions, as under this system extraction should be unnecessary, except in special cases for which specific approval must be obtained. As in the case of the school service, dental supervision of adolescents is on a basis of examination and treatment at six-month intervals. If in the opinion of a dentist, a case requires a form of treatment not provided for in the schedule, there is a provision that such treatment may be approved by the Principal Dental Officer of the district as a Charge on the Fund.

It might be of interest to summarize some of the features of the organization for the adolescent service: Dental officers are appointed at a ratio of 1 to 750 of the eligible age groups; eligibility is contingent upon a patient having undergone regular dental care up to within three months of the time of application either at a School Dental Clinic or at the hands of a private practitioner; enrolled patients receive attention twice a year; use of x-ray for diagnosis; the carrying out of necessary operative and other treatment for both hard and soft tissues; orthodontic treatment for patients referred from primary school clinics; the adoption of modern methods of

control (e.g., lactobacillus count, regulation of carbohydrate intake, fluorine therapy, etc.); and education of the lay public in dental disease as a menace to general health and well-being, and in the means of controlling it.

I believe that the School Dental Nurse system has been responsible for a vast improvement in the dental health of the people in New Zealand. After thirty years in development and operation, the service is not even yet at full strength, though most of the primary school population and more than 20,000 of pre-school age are now under its care. As of March 31, 1948, 476 treatment centers had been established and the staff numbered 709 including 202 student dental nurses in training, or rather more than the number of practicing dentists. The number of children under treatment is 233,981, an increase of 7,183 over the previous year. It is necessary to consider these figures in relation to a total population of approximately 1,700,000. The number of schools receiving treatment is 2,331. The total number of operations for the year was over one-and-a-half million including 1,109,512 fillings in permanent and primary teeth. In contrast with this figure, which represents approximately the number of teeth preserved for useful service, the number of teeth removed as unsaveable or to relieve over-crowding was only 66,750, a ratio of 6.02 extractions to every 100 fillings. In the first year of the program, the ratio was 114.5 extractions to every 100 fillings. This in itself should provide ample evidence of the success of the service.

Including the cost of school dental clinics which is borne by the Education Department, the cost of the service per child is $4 per annum. This includes salaries and maintenance of buildings and student hostels. The cost of training the school dental nurse in New Zealand is $2,400 for two years. This amount can be reduced to $1,600 by deducting $800, the estimated value of her clinical services during the second year of training.

The benefit to the health of the community cannot be computed in dollars and cents. The saving in public money through the virtual elimination of absences from school due to dental disease must be very considerable. Children living in rural areas would have little chance of adequate dental treatment but for the dental nurse. Even in urban areas, except for the privileged few children of enlightened parents who regularly attend private practitioners, treatment in this country consists mainly of emergency extractions. Experience in New Zealand has proved beyond a doubt that the average child reacts best to treatment provided as an integral part of school life, and regular inspection in school clinics is the best possible means of ensuring regular treatment particularly when the influence of the school dental officer, the dental nurse, and the teacher can be used to change refusals into acceptances.

New Zealand's system may have received much more attention than it has in this country were it not for the fact that it is so many thousands of miles away and isolated down in the South Pacific. From a communication just received from Colonel Saunders, Director of the Division of Dental Hygiene in New Zealand, it is learned that Australia, her nearest neighbor 1300 miles away across the Tasman Sea, has recently sent a delegation of ten from the Australian Dental Association and the Commonwealth Department of Health to study the New Zealand School Dental Service.

Though there are a number of references to the Service in American dental literature, notably an excellent article by R. M. Walls in the American Journal of Public Health of April, 1949, up to the present I have seen only one reference by an America dentist who has seen the service in operation. Dr. Weston Price, much travelled author and member of the Research Commission of the A.D.A., spent some time in New Zealand and closely inspected the School Dental Service. In his book *Nutrition and Physical Degeneration*, published in 1938, he makes the following comment: "New Zealand is setting a standard for the world in the care of growing children as well as in other health problems." Referring to the New Zealand School Dental Nurse-Practitioner he makes the following statement: "The operations performed by these young women on children far exceeded in quality the average that I have seen by dentists in America." I make this reference merely to counter any possible suggestion that the service received by New Zealand school chil-

dren is any way inferior to what they might expect to receive under a different system. From my own personal experience and observation I can say that the standard of treatment is excellent; that the high principles and ideals taught in the Training College are maintained in the field clinics to a remarkable degree; that the service has the full and unqualified approval and cooperation of the dental profession and the complete confidence of the public.

There is a definite world trend toward increasing government participation in the public health field, including public health dentistry. This has been brought about by the failure of the profession to meet the needs of the average man and by an increasing awareness of the importance of dental health, stimulated largely through propaganda by the profession itself and leading to an increased public demand for service at a cost that can be met from the family budget. Dentistry, as a health service, should not be limited to the privileged few but should by some means be made available to the under-privileged also. In our practices we see only those patients who are sufficiently enlightened to seek dental care and who are able to pay for our services. We fail to see the woods for the trees. But if we examine the situation closely we must admit that dental service today reaches only a comparatively small proportion of the population. As someone recently remarked, the profession in America is managing to provide better and better dentistry to fewer and fewer people. Dr. John T. Fulton of the Children's Bureau in Washington has stated in the *Journal of the American Dental Association* (1945) that dental defects are accumulating at six times the rate at which they are being corrected. He has produced statistics to show that only about 25 per cent of the total population and considerably less of the younger age groups avail themselves of dental care, and that the average lapse of time between visits is two and a half years. Yet we know that dental caries occurs in 50 per cent of children by age two years and that this figure steadily increases to 95 per cent or more in adolescence.

Just before coming to Boston I carried out a survey, in the course of a fluorine study, of a group of Rochester (New York) school children aged 14 years. The average D.M.F. (decayed, missing, or filled teeth) was 15. Most of these children had had the advantage of six-monthly prophylaxes by dental hygienists and restorative treatment in a dental clinic over a period of years. Yet, taking an average throughout the group, each child had 15½ tooth surfaces requiring filling on the date of examination. Comparable figures have been produced in the Commonwealth of Massachusetts. In this country in the past, clinics have been established in particular areas in accordance with the degree of civic-mindedness of the population, but with no thought to geographical or population needs or the proper distribution of dental care in relation to the caries attack rate. Such hit-or-miss methods can never be effective in substantially improving the dental health of the people. A carefully planned approach to the problem is required, and only a long-term plan will meet the situation.

Even after thirty-six years of trial there is still no convincing evidence that the periodic cleaning of children's teeth by dental hygienists will reduce caries experience. It is economically unsound to increase the period of training of the dental hygienist to two years and still confine her activities to tooth-brushing. Except in educational work she has little value in children's dentistry. The prevailing opinion today is that the chief value of the dental hygienist is as an auxiliary aid to the practising dentist. When we consider the magnitude of the present problem in this country and the valuable type of auxiliary personnel that has been produced in a two-year training period in New Zealand, it would seem wise to at least investigate the possibility of the application of such a system to meet our own increasing dental needs in the sphere of children's dentistry.

The increasingly recognized importance of dental health has thrown the spotlight on Children's Dentistry. Societies have been formed, educational programs have been set up in the schools, Children's Dentistry departments have been organized in dental schools, a Pedodontic Board has been created (not, I trust, with the object of providing better and better children's dentistry to fewer and fewer

children), and February 7, 1949, was designated the first "National Children's Dental Health Day."

This increasingly greater emphasis on Children's Dentistry and the effort to concentrate attention on the fundamental importance of children's dentistry in any public health program is a very healthy sign and evidence of sound thinking; but beyond the promise of some amelioration of the situation by recent research in the preventive field and the possibility of Federal aid to dental schools, no practical measures have as yet been taken to tackle the problem at its source. It is hoped that the project which has been set up at Forsyth Dental Infirmary in Boston to evaluate, on a research or experimental basis, the type of service established in New Zealand will receive the sympathetic attention and cooperation of the profession. This should be supplemented by a delegation to New Zealand of members of the profession to evaluate the results of the School Dental Service.

The mistake made in Britain with the Compulsory National Health Insurance Scheme was to attempt to make dental service available to the whole population at once without any immediate increase in professional personnel and with an already acute shortage of dentists in the country. The profession was unable to cope with the vastly increased demand for dental care, and wholesale resignations occurred from the school dental service by school dental officers who found they could earn their annual salary as a school dental officer in a period of one month under the Health Insurance Scheme. If firsthand reports coming out of the country are correct, there has been a serious and inevitable lowering of standards, and the important school dental service has been largely wrecked. The same thing would doubtless happen here.

I would fully endorse the opposition of the A.D.A. to such a plan, not because I consider it wrong in principle that dentistry should be made universally available at reasonable cost on a comparatively painless prepayment plan, but because there is not the personnel available within the profession to ensure the workability of the scheme. Furthermore, there seems little likelihood that the dentist-patient ratio will be materially improved for many years to come.

It seems obvious, therefore, that the logical approach would be to extend service, as was done in New Zealand, to the younger age groups as rapidly as possible and that the children of school and pre-school age should be our primary consideration. Under existing conditions it seems equally obvious that this important public health function must be assumed or supported by public health agencies.

The two main problems in any health program are cost and personnel. The New Zealand plan offers a solution to both of these. Efficient personnel can be produced twice as rapidly and at a fraction of the cost in training and maintenance that would be required to produce an equal number of dentists.

Dentists need not fear the impact of such proposals on their practices. Despite their earlier opposition to the scheme, dentists in New Zealand soon became aware that nothing was being usurped from them. In actual fact it was found that after being exposed to the educational activities of the school dental service and having experienced the practical benefits of dental care, patients came to dental practitioners with an acute dental consciousness, and practices were swelled by an influx of patients who would otherwise have been ignorant of or indifferent to the value of dental care, and with mouths that could be maintained in dental health.

The dental profession is often accused of offering nothing of practical value in place of the Government's scheme for compulsory health insurance. If the profession were to espouse such a proposal, they would be offering a workable plan in place of an unworkable one, and at the same time would experience the satisfaction of helping the children who are not in a position to help themselves.

With the huge backlog of untreated dental disease in this country and the inadequate manpower available in the profession today, the words of Goethe, as quoted in the *Journal,* have a particular significance: "Little can be accomplished for grown-up people; the intelligent man begins with the Child."

Anesthesia for the Pediatric Dental Patient

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Editor's Note:

Dr. Deming, Director of Anesthesiology, Children's Hospital of Philadelphia, is a graduate of Women's Medical College of Pennsylvania, practicing pediatric anesthesiology and teaching the subject at the University of Pennsylvania. Raymond Werther, who obtained this article for us, tells us she is extremely cooperative with the Dental Division at Children's Hospital, and is a wonderful anesthesiologist. This article possesses much of practical interest to the well-informed dentist, and we're sure you'll like it.

A.E.S.

The choice of anesthesia for the pediatric dental patient is important not only to achieve satisfactory working conditions for dental procedures but also from the patient's point of view, (and incidentally, the parent's). Failure to appreciate these facts may result in serious neglect of dental problems, the parents being unwilling or unable to force the child to continue dental care when he rebels against repetition of an unpleasant experience. The less physical and mental trauma there is, the greater will be the cooperation from both patient and parent. All of the methods and drugs used to produce anesthesia or analgesia in adults are applicable with technical variations to the pediatric patient, but the indications for each are somewhat different. The two major types; regional analgesia and general anesthesia are widely used, and each has advantages and disadvantages when employed for children.

Regional analgesia for dental procedures is probably more frequently used than any other type of pain relief. The success of this type of analgesia is in large measure proportional to the skill of the administrator and his ability to win the confidence of the patient. It must be admitted, however, that there are many children who are not suitable candidates for this type of anesthesia because they cannot or will not cooperate. The spoiled child, whose well-meaning but unwise parents have overindulged him, is often very difficult to manage with local anesthesia. The very young, the mentally defective and the child with motor disabilities of the spastic type often cannot cooperate. Children with convulsive disorders may have attacks precipitated either from nervous stress or from side effects of the drugs used. Certain types of dental procedures are facilitated by having the patient asleep and relaxed, and in the presence of intra-oral infection, regional anesthesia is difficult to achieve. In spite of these disadvantages, and the increased time often necessary to "talk" the patient into accepting needles, local anesthesia possesses some very real advantages. First, it is an office procedure and the patient retains consciousness and can cooperate. Second, there is little if any time necessary for recovery from anesthesia and only rarely will there be nausea and vomiting. Third, severe idiosyncrasy and resistance to the drugs commonly used is rare in children. Fourth, little special equipment is necessary, and the cost of the agents is low. Fifth, there is no explosive hazard as is present with many general anesthetic agents.

The technique of regional analgesia is far more familiar to you who use it daily than it is to me. My own personal experience with intra-oral block analgesia is almost exclusively from the business end of the needle, and I can highy recommend this type of pain relief. The dental profession is to be congratulated upon the generally superior skill achieved in the technique of regional analgesia.

Our concern is primarily with those children, who because of age, emotional disposition, acute or chronic organic disease, or type of dental procedure are unsuitable for local analgesia. General anesthesia may be used both successfully and safely for any dental procedure in children. There are certain fundamental differences between children and adults which must be taken into consideration when administering general anesthesia to children. These peculiarities are present regardless of the agent which is employed.

The child is not just a miniature adult, but is a growing and unstable organism. The process of physical growth is associated with an elevated metabolic rate, a physiologic state in children. This influences general anesthesia in several ways. First, a proportionately larger amount of anesthetic agent per unit of body weight is required to obtain the same degree of anesthesia in children as in adults. Second, the oxygen requirement is relatively greater for the child. Third, it is one of the chief reasons that the induction of general anesthesia in children is apt to be more prolonged and accompanied by greater muscular activity than in the adult, for time is necessary to get sufficient quantity of agent into the blood stream and to the central nervous system, while still providing adequate oxygen for the patient's metabolic requirements. The elevation of basal metabolic rates makes satisfactory anesthesia with nitrous oxide alone difficult without producing a moderate to severe degree of hypoxia, often manifested by cyanosis.

It has often been said that children are resistant to hypoxia, that is, they can tolerate periods of low oxygen supply of a greater degree and longer duration than can adults. In the sense of survival this statement is probably true, but it is not true in regard to damage to the central nervous system, especially the cerebral cortex, which is the tissue most sensitive to oxygen deprivation. Clinically it is far easier to detect cortical damage in adults than it is in children, for the evidences of minimal cortical damage are personality change, inadequate or abnormal emotional response to ordinary situations and memory defects. In the child, the personality is still being formed, the emotional responses are unstable and unpredictable and the memory span difficult to evaluate. The only signs that the cortex has been injured in the child may be a delayed recognition by the parents that progress in school has been slowed or that difficulties in getting along with playmates are becoming more and more noticeable. Although there may be in time, some compensation for the cortical damage from hypoxia, it is a tribute to the reserves with which humans are endowed and not to the skill or luck of the anesthetist.

Sensitivity to hypoxia varies considerably from one child to the next. Some children withstand severe degrees of hypoxia without demonstrable evidence of damage to the central nervous system, while others react poorly to even mild degrees of oxygen deprivation. Children with anemia, congenital deformities, a history of frequent convulsions in infancy or a family history showing a high incidence of central nervous system pathosis are apt to be more sensitive to oxygen want. No clinical means of detecting those who are sensitive to oxygen lack has yet been devised, and the only means of avoiding the unpleasant sequelae that may occur in such a susceptible child is to avoid anoxic techniques in anesthesia.

Children also differ from adults in that chemical reserves and chemical equilibrium are very tenuous. It is easy to disturb the normal electrolyte balance, and this results in mild to severe degrees of acidosis or alkalosis. Acidosis is more frequently seen than alkalosis, but both are known to occur. These states usually make their appearance in the post-anesthetic period. Acidosis, if mild, will be asymptomatic, but moderate to severe degrees will cause prolonged nausea and vomiting, diminished urinary output and convulsive seizures. With alkalosis there will be moderate degrees of rigidity and carpopedal spasms, restlessness, nausea and vomiting and depression of respiration. The milder states of electrolyte imbalance will correct themselves spontaneously if the child is otherwise healthy. More severe states may necessitate active therapeutic measures. Neither condition is commonly severe enough to produce symptoms, but when symptoms do develop

they can be very annoying, especially to the parents who must assume the burden of post-anesthetic care.

Emotional instability, while not exclusively an attribute of childhood, is a far more fundamental condition than in adults. Children have not had sufficient experience to stabilize emotional responses, and consequently they frequently overreact to situations. Profound abnormalities of emotional and personality development may arise from apparently trivial psychic trauma. It is difficult to give a child complete understanding and satisfactory reasons for the need for his cooperation in completing necessary dental work, and failure to do this may result in an antagonistic or negativistic attitude. It is well to remember that the child is far less concerned with the nature of the operation than with the terrifying prospect of being rendered unconscious. In general, guiding the parents to take a more realistic attitude toward anesthesia and preparing the child to face it, will do more to relieve the child's tension and anxiety than will the common practice of evasive lies and promised rewards for good behavior. The latter approach destroys the child's confidence in his parents and results in emotional insecurity.

Anyone who plans to administer an anesthetic to children for any procedure must have certain emergency equipment readily available and in efficient working condition. The necessity of some type of equipment for resuscitation is obvious. Unfortunately, general anesthetics cannot be given in a specific, predetermined dose as with many drugs such as aspirin, but the amount of anesthetic given is enough to produce the desired degree of narcosis. No drugs are pushed as close to the physiologic limit of tolerance as are anesthetics. The margin of safety, while usually more than adequate, may for some children be very small, and to these an overdose is readily given. Then too, though infrequently, toxic reactions such as convulsions or circulatory collapse may occur very suddenly, and a means of maintaining adequate oxygenation must be ready, for these very occasional untoward reactions. The absolute minimum is a suitable mask and reservoir bag, and a source of 100 per cent oxygen. Satisfactory ventilation can be done by rhythmic compression of the filled reservoir bag with the mask fitted snugly to the face.

In intra-oral surgery, all possible means must be taken to protect the patency of the airway. Obstruction may be due to many causes, among the most common of which are the falling backward of the tongue and mandible when relaxation occurs, blood, pus or vomitus, and foreign bodies such as sponges or teeth. When support of the mandible fails to lift the tongue sufficiently far forward to restore the airway, a grasping forcep or a mechanical oropharyngeal or nasopharyngeal airway may be used. Obstruction from this cause is more common in children, especially if large tonsils and adenoids are present since they encroach upon the patency of the upper respiratory tract. Blood, pus and vomitus must be removed as soon as their presence is detected. A mechanical aspirator is most convenient for this, but there are several satisfactory hand suction pumps available. Solids cannot be removed by ordinary suction devices, but these can be removed with forceps or with a gauze covered finger.

When it has been decided to administer general anesthesia to a child some basic information about the physical status, and preparation of the patient is necessary. If the parents are reliable (or the family physician, if they are not) a statement should be obtained concerning the ability of the patient to withstand the anesthesia. This is a necessary protection for the anesthetist should an unforseen accident occur. For elective procedures, the child should be free from upper respiratory infection. It is also common knowledge that the stomach should be empty before starting anesthesia. This reduces the chances of emesis during induction, and hastens recovery by decreasing post-anesthetic nausea and emesis. How long does it take for the child's stomach to empty? This is a very variable period of time, and is increased by emotional strain, fear, high fat content in the diet and excessively large meals. The average time is four to six hours. As a rule, no solid food for eight hours, and no liquids

for six hours before anesthesia is given will provide satisfactory conditions. Fruit juice with added sugar given six hours before anesthesia often helps to reduce hunger and provide some protection against starvation acidosis.

One of the questions most frequently asked is — should children receive preanesthetic medication? The answer is a most emphatic yes. Sedative, hypnotic and analgesic drugs all tend to reduce the amount of anesthetic agent which is required, and thereby increase the margin of safety. In addition they tend to decrease or eliminate the fight which the child puts up when anesthesia is induced, and to decrease the duration of the excitement stage. If barbiturates are used preanesthetically, they tend to prevent the convulsions which are occasionally seen under general anesthesia. For the patient who is to receive anesthesia as an out-patient or office patient, only a barbiturate for sedation need be given. However, the child who is to undergo a prolonged dental procedure and who is an in-patient, morphine should be given in suitable dose. This drug reduces the basal metabolic rate even more than the barbiturate and thereby reduces the oxygen demand. In suitable dosage, morphine prevents exhaustion which may result from excessive respiratory rate—especially if volatile agents are used. The vomiting that morphine often produces is lessened by giving a barbiturate at the same time. Nembutal and seconal are both used for preanesthetic sedation and the choice of which is to be used will largely depend upon the one with which the anesthetist is most familiar.

The belladonna derivatives are also a part of the preanesthetic medication. Atropine and scopolamine are used primarily for their drying effect upon the secretions of the upper respiratory tract. Often these secretions may be so excessive that respiratory obstruction may occur due to their presence. Of the two drugs, scopolamine is probably preferable in children, since it is more drying than atropine and smaller doses can be used with less danger of toxic side effects. Scopolamine is a depressant to the cerebral cortex, and enhances the effects of barbiturates and morphine. Atropine, on the other hand, is a stimulant to the cerebral cortex, and therefore dues not possess the potentiating action of scopolamine. The duration of the "drying" action of scopolamine is abour twice that of atropine, and therefore will be effective should the administration of anesthesia be delayed.

For out-patients then, a barbiturate and scopolamine should be given one hour before anesthesia, or a barbiturate and atropine should be given one hour before starting anesthesia. In addition, if the patient is an in-patient, morphine sulfate should be given one hour before going to the operating room.

From the anesthetist's point of view, dental procedures can be classified as either major or minor procedures, depending upon the time necessary to complete the procedure, the site of the dental work, and the nature of the operation. Minor procedures can readily be done as out-patients, and can be managed safely with a little thought and care. It is our opinion that procedures lasting more than fifteen to twenty minutes ought not to be done on the ambulatory pediatric case.

There are many agents that can be used for the ambulatory case and probably the most satisfactory is a nitrous oxide-oxygen mixture. The addition of one of the volatile agents such as vinethene or ethyl chloride to enhance its potency may be necessary. However, a child who is well sedated by his preanesthetic medication, or who has received a dose of morphine sulfate often can be handled with nitrous oxide and oxygen alone. When such techniques are used consciousness is regained quickly, and after lying down for a period of ¾ to 1 hour, the child can go home with some responsible member of the family. No child should be allowed to leave the dental office unaccompanied, for some confusion and dizziness may persist for several hours, even though the patient may deny it in the hope of leaving promptly. If the patient appears to have no ill effects from his premedication it may be repeated or if one elects to go ahead with the anesthesia, a more potent agent should be used. This can readily be done with vinethene, with oxygen and with or without nitrous oxide as an insufflating agent through

a nasal airway. This is a more satisfactory technique than the regular open drop technique for the anesthetist is well out of the operating field and a more even maintenance of plane of anesthesia is easily obtained. Recovery will be somewhat longer than with the nitrous oxide technique, but not sufficiently so as to be disturbing. Nausea and vomiting are no more frequent than with nitrous oxide and oxygen.

Ethyl chloride may be used for general anesthesia. This drug is not as popular as it was at one time for this purpose. Induction is very brief, it is a potent anesthetic agent, and can be used in combination with nitrous oxide as is vinethene. Nausea and vomiting are rare following its use provided there is no anoxia. Its chief disadvantage lies in its toxic manifestations, which are the cardiac arrhythmias which are common to most halogen containing anesthetics. Peripheral circulatory collapse has been reported occasionally when ethyl chloride has been used as the sole anesthetic agent. Children take ethyl chloride very well for it has a sweet odor and is non-irritating to the respiratory tract. It is frequently used in our clinic for the induction of general anesthesia and to date there have been no untoward effects.

One of the newer anesthetic agents used for dental work is trichlorethylene or trilene. This liquid agent with a high boiling point, is difficult to vaporize, and is not suitable for open drop use. Numerous devices for inhalation of this agent have been developed by the British, many of whom report good results. One method suggested for children has been the use of an oversized "Benzedrine Inhaler." The contents are removed and replaced with a gauze or filter paper wick which is then saturated with trilene. The child uses the inhaler in the same manner it is used for vaso-constriction of nasal mucosa. Good analgesia and amnesia is said to be obtained by this technique. Trilene can never be used in a closed carbon dioxide absorption system since soda lime causes its decomposition into toxic products. Cardiac irregularities and death from ventricular fibrillation have been reported under trilene anesthesia and its exact place in the armamentarium of the anesthetist is still to be determined.

When major dental procedures are to be carried out in children it is probably best that the child be admitted, at least for overnight, to a hospital. To those parents who object because of the cost, one can remind them that it is worth it if only for the increased safety that can be obtained there and that if they are members of the Blue Cross the expense is negligible. Children who have organic heart disease, a previous anesthesia attended with difficulty from any cause, and where adequate equipment is not available in the out-patient department should have hospital care. Many dentists object to taking the patient to the hospital for they feel that they are not given equal opportunities with surgeons to use the operating facilities and anesthetists' services. This is undoubtedly due to mutual misunderstanding. Some of this has resulted from failure to schedule cases accurately. Dental extraction may mean a simple extraction of a lateral incisor, two or three impacted teeth, or uprooting piece-meal a decayed remnant of a tooth. To give an endotracheal anesthesia for a three minute extraction is unnecessary and leaves the anesthetist feeling rather silly, but if left in the dark as to the nature of the operation one can only prepare for a major procedure. Most hospitals require certain minimum laboratory studies such as a blood count and urinalysis before giving general anesthesia for elective surgical operations. Frequently the dental patient has not had these studies, and insistence on getting them delays the operating schedule. If general anesthesia is refused because the patient is improperly prepared, everyone's feelings get hurt. Dental operative schedules will be facilitated if the minimum studies are arranged for in advance and the results properly recorded on the patient's chart. I might point out that some of these rules and regulations are part of the state law in Pennsylvania and not a whim on the part of the hospital.

When a child is hospitalized, reaction time from anesthesia ceases to be the chief consideration in the choice of anesthetic agent. Almost any agent which provides good working conditions may be used, as well as full

preanesthetic sedation with a barbiturate, morphine and scopolamine. When it is likely that there will have to be multiple procedures, the younger children and spoiled children will be more readily managed with basal anesthesia. Our experience leads us to believe that one of the best agents for producing basal anesthesia in children is rectal pentothal. This method provides good amnesia pre and postoperatively with light sleep for several hours after anesthesia. The dose is 4.5 to 6.0 mg. per pound of body weight, as a 0.6 per cent solution. The child usually falls asleep in 10 minutes and there is little depression of respiration. The protective laryngeal reflexes are present in basal narcosis with this agent. Anesthesia is induced by an open, semi-open or closed technique and when the desired plane is reached a nasotracheal tube is inserted. This protects the airway from aspiration of foreign material, prevents laryngospasm, and provides good working conditions in lighter planes of anesthesia than can be maintained without endotracheal intubation. Older children whose preanesthetic medication is satisfactory are often induced with intravenous pentothal. Children tolerate large doses of barbiturates well and this resistance to barbiturates makes them unsuitable for pentothal as the sole anesthetic agent. It is not uncommon in children to find that pentothal, given to the point of respiratory arrest, has not produced satisfactory anesthesia and any painful stimulation results in a mass reflex withdrawal, phonation or a violent cough. However, intravenously, it does provide a swift, smooth induction and the maintenance of anesthesia with other agents is facilitated.

Nitrous oxide and/or cyclopropane also produce swift and satisfactory induction of anesthesia and the gradual addition of ether to deepen the anesthesia for intubation is an easy technique to apply to children. The maintenance of anesthesia by open or semi-open techniques such as insufflation through the endotracheal tube, particularly in the younger children is better than a strictly closed carbon dioxide absorption system. The relatively large dead space with consequent rebreathing and resistance of such systems particularly for long procedures may produce serious disturbances in respiration and circulation due to carbon dioxide retention and respiratory exhaustion.

For the occasional patient who cannot or will not cooperate and who is in need of extensive dental procedures, it is possible to maintain safe anesthesia for the preparation and filling of cavities and for extractions—the work so planned that it is completed during the one anesthesia. For any such prolonged procedure in children, where electrical equipment is to be used, our method is a combined inhalation and intravenous technique. Anesthesia is induced with a solution of pentothal sodium 2.5 per cent containing 3-5 units of d-tubocurarine chloride in each cubic centimeter. When relaxation has occurred, an endotracheal tube is inserted by the nasal route, and insufflation with 50:50 nitrous oxide and oxygen through a Y connection. This latter permits adequate control of respiration if necessary and reduces the amount of fixed anesthetic agent required. Such a technique permits the safe use of electric equipment and all the dental work can be completed at one time. Children usually react promptly, though complete detoxification of the d-tubocurarine may require several hours.

Following general anesthesia in children, the recovery period is usually brief. During this time the child should be kept lying down in the lateral decubitus position and if any oozing is expected from the operative site the foot of the bed should be elevated. Liquids may be started as soon as nausea has ceased, and a soft diet given within a few hours. The elaborate preparation with purgation and enemas once used, is unnecessary, for it will not reduce the incidence of postoperative nausea and vomiting and is definitely objectionable from the child's point of view.

Suggested Preanesthetic Medication for Dental Anesthesia

Age	Weight	Morphine Hypo. 1 hr. Preop.	Nembutal Oral 1 hr. Preop.	Scopolamine Hypo. 1 hr. Preop.	or Atropine Hypo. 1/2 hr. Preop.
2- 3 yrs.	27-30 lbs.	gr. 1/64	gr. 1/2	gr. 1/400	gr. 1/300
3- 5 yrs.	30-40 lbs.	gr. 1/48	gr. 3/4	gr. 1/300	gr. 1/200
5- 8 yrs.	40-55 lbs.	gr. 1/32	gr. 3/4	gr. 1/300	gr. 1/200
8-10 yrs.	55-65 lbs.	gr. 1/24	gr. 1	gr. 1/200	gr. 1/150
10-12 yrs.	65-80 lbs.	gr. 1/16	gr. 1	gr. 1/200	gr. 1/150
12-14 yrs.	80-90 lbs.	gr. 1/8	gr. 1-1/2	gr. 1/150	gr. 1/100
Over 14 yrs.	Over 90 lbs.	gr. 1/8-1/6	gr. 1-1/2 - 3	gr. 1/150-1/100	gr. 1/100-1/75

1. Out-patients and office patients do not receive morphine routinely, but it may be advisable for hyperactive children.
2. Hospitalized patients and those patients who are to have major oral surgery receive morphine, nembutal and scopolamine or atropine, whether or not basal narcosis is used.

"You're going to have to handle this child carefully; remember you've dealing with a sensitive, high-strung little stinker!"

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★ ★ ★

Ken Lawrence of our Missouri Unit has been doing a little gospel work in his favorite field of dentistry for children, appearing before the Wichita, Kansas Dental Society in September and before the Tri-State Dental Meeting at Keokuk, Iowa in October. Nice going, Ken!

From our active correspondent, Dr. Wegener, of Lincoln, Nabraska, we have the following items about men in that area:

Dr. Ralph Ireland spent the first part of August in Wisconsin fishing, but has been pretty mum about it since returning. Evidently the big one got away.

★

Dr. and Mrs. Earl Lampshire are proud parents of a baby girl, Linda Kay, born August 25th in Lincoln.

★

Dr. and Mrs. Lyle Furst are also in this category, having had a baby girl in Lincoln the end of August.

★

Dr. Laren Teutsch and Doris Valske were married at the Dundee Presbyterian Church in Omaha on June 14th.

★

Also noted in the Omaha District Dental Society's Magazine, "The Chronicle" that Laren Teutsch won first award for the best article in Volume 12 of the Chronicle. The Title was "Preventive Dentistry Begins with Baby Talk" and ran for two issues.

★

Dr. E. L. Lampshire, Dr. B. L. Gainesforth and Dr. Laren Teutsch all presented clinics at the State meeting in June, and all had large groups around their tables at all times. Incidentally, all three appeared on the A.D.A. program in San Francisco in October.

★

Wallace Webster, Past-President of the Nebraska Unit, who is now devoting his full time to the Practice of Oral Surgery, has completed taking additional work at the University of Michigan on Cleft Palate and Hare Lip.

★

The Graduate program of Pedodontics at the University of Nebraska is going along very nicely under the able direction of Ralph Ireland, and at the present writing numbers five students, all of whom belong to the A.S.D.C.

Thank you for your nice report, Wegy!

Paul Taylor, of our Texas Unit, has enrolled in the University of Michigan School of Dentistry Graduate Division, where he will pursue his work for a Master's degree in Pedodontics. We've seen Paul at the Michigan Unit meetings this year, so we know he's still interested in A.S.D.C. affairs.

★ ★ ★

We congratulate Maury Massler, who was recently promoted to the rank of Professor of Graduate Pedodontics at the University of Illinois College of Dentistry.

★ ★ ★

Jim Schofield, who is completing his work for an M.S. degree in Pedodontics at Ann Arbor, plans to enter active practice at Jackson, Michigan. It is gratifying to see men of Jim's caliber successful in cities of Jackson's population.

★ ★ ★

A children's clinic is being established at the Marquette University School of Dentistry, with the aid of a grant of $15,000 for equipment from the children's bureau of the United States Public Health Service. Arrangements were made through the cooperation of Dr. Carl N. Neupert, Madison, State Health Officer, and Dr. F. A. Bull, Dental Director of the State Board of Health.

Dr. O. M. Dresen, Acting Dean of the dental school, announced that the new equipment will be installed as a part of the present dental clinic until the proposed new addition becomes a reality.

Dr. Dresen has announced the appointment of Dr. John M. Frankel, a graduate of the University of Illinois, as director of the departments of pedodontics and dental hygiene. Dr. Frankel has a degree of master of science in pedodontics. He succeeds Dr. George E. Morgan, who recently resigned to devote his time to private practice.

★ ★ ★

Amadeo Pacetti, a new member from Kenosha, Wisconsin, retired recently as president of the Kenosha County Dental Society, and was named to the board of directors.

Dr. John A. Koch of St. Paul has been added to the Pedodontic Department of the University of Minnesota. A graduate of 1944, John spent two years in the service, and is now devoting the major part of his practice to dentistry for children.

★ ★ ★

From St. Louis comes a note that Dr. Florence Rich and Mr. Joseph Gutfreund were married November 20th. We extend the greetings of our members to the happy couple, and wish them many years of pleasant living.

★ ★ ★

Henry Jann, of Buffalo, writes that he and his wife were in Toronto recently and heard an excellent symposium on Thumbsucking. Sandy MacGregor did an unusually fine job of presenting the dentists' viewpoint, says Jan.

★ ★ ★

Gene North appeared before the Buffalo Study Club recently, speaking on "The Psychobiologic Aspects of Child Management." His audience kept Gene in a long session, so interested were they in the presentation.

★ ★ ★

Sandy MacGregor, of Canada appeared on the program of the Ohio State Association at Columbus, Ohio in November, and was, as is to be expected, well received. Sandy knows how to put his message across!

★ ★ ★

Stanley Korf, Editor of the Illinois Unit, master-minded a beautiful publication entitled "Your Child Patient," put out by that Unit. It is planned to make the magazine a regular item, and we hope they keep our name on the mailing list. Congratulations, Illinois!

★ ★ ★

It was nice to hear from Bill Orobko, 'way up in Edmonton, Alberta, Canada. His local study club is interested in A.S.D.C. activities, and Bill has promised to prepare a paper for us on a subject of his choice. We'll be looking for it soon, Bill.

Send items of interest for this column to: Al Seyler, 14615 E. Jefferson Ave., Detroit 15, Michigan.

Dr. Philip E. Adams (left), of Boston, the new president of the American Dental Association, is shown above with Dr. Harold W. Oppice, of Chicago, new president-elect, at the close of the A.D.A.'s 90th annual session at San Francisco. Dr. Oppice was unanimously elected to the position of president-elect by the House of Delegates.

Dr. Adams has been active in the affairs of organized dentistry since his graduation from Tufts Dental School in 1918. In 1927 and 1928 he served as secretary of the Metropolitan (Boston) District Dental Society and for 20 years was the secretary of the Massachusetts Dental Society. Dr. Adams also served 11 years as a member of the A.D.A. Board of Trustees and two years ago held the office of first vice president.

Dr. Oppice, who will become president of the Association in November 1950, at the close of the 91st annual session at Atlantic City, has been engaged in the private practice of dentistry in Chicago for the past 29 years. He formerly was president of the Chicago Dental Society and editor of the Illinois Dental Journal. For several years he has been a member of the faculty of the Chicago College of Dental Surgery, dental school of Loyola University, where he now holds the position of professor of crown and fixed bridge prosthesis.

The Use of Photoelasticity in a Study of Cavity Preparations

MELVIN A. NOONAN, D.D.S., M.S.
Birmingham, Michigan

Editor's Note:

Mel Noonan, editor of Unit News of the Journal, received his D.D.S. degree from the University of Detroit, and his M.S. in Pedodontics from the University of Michigan, after his return from the Service. He is associated with the Pedodontics Division of the Detroit school, and engaged in the private practice of pedodontics in the suburb of Birmingham, near Detroit. His efficient, charming wife and assistant, Laurene, manages to keep his Irish effusiveness and temerity from getting him into serious difficulties, and we agree with Joe Hartsook that "Mel will go places in dentistry."

This paper, of definite scientific nature, is an interesting presentation of a hitherto untouched method of cavity preparation evaluation, and was prepared with the cooperation of R. W. Swinton and R. T. Liddicoat of the University of Michigan School of Engineering, and Ken Easlick of the School of Dentistry.

A.E.S.

Introduction

Cavity preparations have been studied for a great number of years but there is still opportunity to improve this phase of operative dentistry. Because of an interest in the improvement of the quality of amalgam restorations in the primary dentition, a study of the mechanical problems involved in cavity preparation for this material was undertaken. Although not many conclusions can be drawn from the experimental situations arranged, the technic that has been employed will introduce to the profession one, and perhaps, a new, method of study.

A thorough study of cavity preparation for living teeth would have to include such phases as a histological, anatomical and peridontal appraisal; a consideration of caries control and an estimation of the complicated engineering problems of mastication.

The engineering profession has been able to study the weaknesses of designs of structures by the use of photoelasticity. The models are made of materials such as celluloid, acrylic and Bakelite. Plane stressed Bakelite becomes doubly refractive. It repolarizes the lightbeam in the so-called planes of principal stresses. The emerging lightbeams from the specimen are retarded relatively by an amount that is proportional to the difference in the principal stresses. By passing this emerging light through a crossed polaroid or "analyzer" and "interference" or stress pattern of "fringe orders" is obtained. From the stress or fringe orders, it is possible to compute the amount of stress.

The present study was conducted on different shaped cavities in Bakelite packed with silver amalgam. After the amalgam was set, the samples were studied under polarized light in an effort to determine the advantage of one cavity design over another.

Although many samples were tested, this report will cover only three which may be considered the most important of the group studied.

Procedure for Preparing Samples

Squares of clear Bakelite (⅜" x ⅞" x ¼") were cut and the corners rounded. Cavities with bases approximately ¼ sq. inch (.27 x .27) were prepared in the blocks. A matrix band was adapted around each cavity and the amalgam was packed into place. S. S. White's True Dentalloy was the alloy of choice and it was mixed according to the manufacturer's directions and the samples were packed on a packing pressure gauge. The cavities were

overpacked; the excess amalgam was removed from the surface and the specimens were allowed to set for 24 hours.

The outer surfaces of the Bakelite were polished to remove strains or stresses left by cutting and to prevent changes in the refraction of light caused by a rough surface.

The specimens were first photographed with zero external load.

Methods of Testing

A known load was applied to the center of the restoration and the development of the stress pattern was observed and photographed. The change in fringe orders was observed and the stress bands were counted carefully. The results were tabulated.

The load was increased about twice the previous amount and the same procedure of photographing and counting fringe orders was repeated.

The fringe orders are as spectacularly colored as a spectrum. One complete fringe order extends from yellow to red to green. The colors are very attractive but the photographs in this study were made in black and white; from black to black represents one fringe order.

The loading frame used was constructed as that when a weight of 10 pounds was applied a line load of 54.7 pounds was produced and a 20 pound weight would produce a line load of 95.4 pounds.

Results of Findings

Sample A represents a proximal box cavity or a cross-section of an occlusal restoration which is circular at the base.

In photoelastic experimentation it is necessary to calibrate or to obtain certain optical constants connecting fringe orders with stress. The stress on a half circular base is known and therefore this restoration was used to obtain the calibrated constants.

Figure I is a photograph of the sample showing the residual stresses caused by cavity preparations, the packing and expansion of the amalgam and also a slight amount of retained deformation caused by loads applied previous to photographing.

Figure II represents the same sample with a line load of 54.7 pounds applied gradually to the middle of the restoration. The development of fringe orders was observed carefully and they were counted. The load caused an increase of 2 2/3 bands.

It was determined that each fringe order represented 386 pounds per square inch. In other words there is a maximum stress of 1,030 pounds per square inch at the base of the preparation but the stress decreases with the distance from the center point of the base.

When the load was increased to 95.4 the stress concentration at the center point of the base was increased to 1,800 pounds per square inch. (Figure III.) A total increase of 4 2/3 fringe orders was noted at the computed stress of 1,800 pounds per square inch.

Sample A

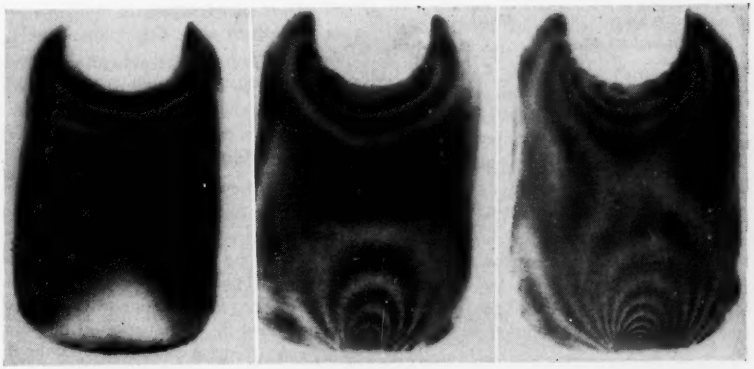

FIGURE I FIGURE II FIGURE III

Sample B

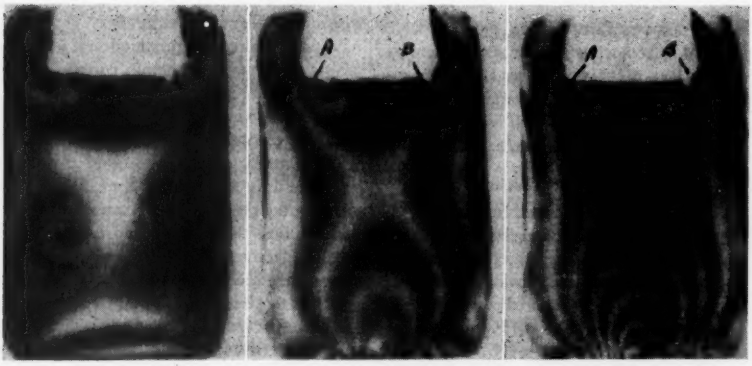

FIGURE I FIGURE II FIGURE III

Sample B represents a proximal box cavity or a cross-section of an occlusal restoration which has a flat floor and the sides converge toward the occlusal surface. The preparation has sharp line angles.

Figure I is a photograph of the specimen with residual stresses caused by cavity preparation, packing and expansion of the amalgam and retained deformations of previously applied loads prior to photographing.

Figure II demonstrates the same sample with a line load of 54.7 pounds applied to the center of the restoration. The fringe order has increased a net value of 2 1/3 bands. If the distribution of the load were uniform, the stress would be equal to load ÷ area. This condition is known as the nominal stress.

$$\text{The nominal stress} = \frac{54.7}{.27 \times .27} = 752 \text{ psi.}$$

The computed or maximum stress according to the fringe order = 2 2/3 X 386 = 905 psi. The stress is maximum at points A and B with the area between these points showing less stress.

$$\text{Stress Concentration Factor} = \frac{905}{752} = 1.2$$

This factor indicates that the stress is not uniformly distributed over the supporting area. The highest stress is 20 per cent higher than the average and it occurs at points A and B.

Figure III is Sample B with a line load of 95.4 pounds applied gradually to the center of the restoration or a nominal stress of 1,310 pounds per square inch. The fringe orders were closely observed as the load was applied. There was an increase of 1 2/3 fringe orders which produced a net sum of 4 bands.

4 X 386 = 1,540 psi. = maximum stress

Points A and B are points of greatest stress concentration.

$$\text{Stress Concentration Factor} = \frac{1,540}{1,310} = 1.2$$

Sample C

Sample C represents a proximal box or a cross-section of an occlusal restoration with rounded corners.

Figure I is Sample C representing residual stress caused by the cavity preparation, packing and expansion of amalgam and retained deformation of previously applied loads prior to photographing.

Figure II shows the stress pattern in Sample C after a line load of 54.7 pounds is applied. The fringe order has increased by two bands. As in the previous sample the nominal stress is 752 pounds per square inch. The computed stress is 772 pounds per square inch as determined by the equation in results of Sample A. Points A and B are receiving the

Sample C

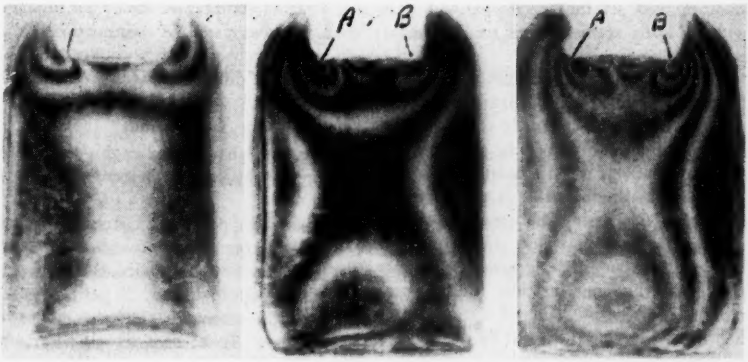

FIGURE I FIGURE II FIGURE III

greatest stress and the stress in the area between these points is somewhat less.

Stress Concentration Factor = $\frac{772}{752} = 1.03$

Figure III is the same sample with the line load increased to 95.4 pounds. This load would produce a nominal stress of 1,310 pounds per square inch. The fringe orders were observed carefully and counted and had increased by 1 2/3 fringe bands. Therefore the computed stress is 1,430 pounds per square inch using the value of 386 pounds per square inch per fringe. The calculation gives a Stress Concentration Factor = $\frac{1,410}{1,310} = 1.09$

Interpretation

The interpretation of the results cannot be accomplished completely from the photographs because the stress patterns must be observed carefully during their formation and the fringe orders counted. In this study only the upper half of the photographs is important.

Sample A which represents a proximal box or a cross-cut section of an occlusal preparation has a greater computed stress which is concentrated at the base than Samples B and C. It must be remembered that the loads applied are the same for each specimen.

Sample A has a net increase of 4 2/3 fringe orders. Samples B and C have net increases of 4 and 3 2/3 fringe orders respectively. The fractions are determined by the colors in each fringe order. In color, a complete fringe is green to green but one-third the distance is green to yellow and two-thirds is green to red.

Sample B, which represents a proximal box and a cross-cut section of an occlusal restoration with the walls undercut for retention, has slightly more stress than Sample C which has rounded corners. In mechanical engineering it has been established that a sharp point V will have a greater stress concentration than a blunt or rounded point U. If a load is applied to these two designs more fringe orders will be formed about the sharp point. Both Samples B and C have a stress concentration at the angles but have fewer stress fringe orders than Sample A.

The Stress Concentration Factor is derived from the following equation S. C. F. = Computed Stress ÷ Nominal Stress.

If the stress were equally distributed the nominal stress and computed stress would be equal to each other and the Stress Concentration Factor would be 1. In each of the samples there are areas or points which are overstressed or have stress concentrations.

Summary

This study presents an introduction of the application of photoelasticity to research on restorative dentistry. The research was con-

ducted on different shaped cavities in Bakelite packed with silver amalgam. After the amalgam was set the specimens, with and without loads applied, were studied under polarized light.

Plane stressed Bakelite becomes doubly refractive. It repolarizes the lightbeam in the so-called planes of principal stress. The emerging lightbeams from the specimen are retarded relatively by an amount that is proportional to the difference in the principal stresses. By passing the emerging light through a crossed polaroid a stress pattern is obtained. The pattern demonstrates the points of highest stress concentration. It also is possible to compute the value of a fringe order and by multiplying this value by the number of bands the amount of stress is resolved.

Sample A which represents a proximal box or a cross-section of an occlusal restoration with a rounded floor had more fringe orders formed when a load was applied than did Samples B and C which have flat floors. Less fringe orders for the same applied load indicates less stress concentration.

Sample C which had rounded corners had 1/3 fringe order less than Sample B which had sharp corners; and though only slightly, it indicates that a rounded corner produces less stress concentration than a sharp corner.

With the information obtained from this study, more complicated cavity preparations could be investigated. A continuation of this study will uncover many advantages and disadvantages of different designs in cavity preparation.

Conclusions

From the data obtained in this study three definite conclusions can be made. They follow:

1. A flat floor permits less stress concentration than one which is rounded. In the flat based restorations studied, the maximum stress is approximately 20 per cent greater at the corners than at other points on the base. To be of a serious nature the maximum would have to be 50 per cent to 100 per cent greater.
2. A rounded angle permits less stress concentration than a sharp angle.
3. Retention points should not be sharp but rounded to decrease stress concentration.

BIBLIOGRAPHY

1. Frocht, M. M. Photoelasticity. New York, Wiley and Son, 1941. XXVI 411 p.
2. Frocht, M. M. Photoelastic studies in stress concentration. Mechanical Engineering, 58:485-9, Aug., 1936.
3. Swinton, R. W. Personal communication. May 12, 1948.

The Ohio State University College of Dentistry announces the following schedule for its postgraduate courses in dentistry to be presented during the early months of 1950:

Oral Pathology	Hamilton B. G. Robinson	January 9-13
Anesthesia	M. Lowell Allison	January 16-20
Oral Surgery	D. P. Snyder	January 23-27
Periodontia	John R. Wilson	January 30-February 3
Dentistry for Children	Lyle S. Pettit	February 13-17
Partial Dentures	Victor L. Steffel	February 20-24
Full Dentures	Carl O. Boucher	February 27-March 3
Endodontia	J. Henry Kaiser	March 6-10
Anatomy	Linden F. Edwards	March 20-24

Each course is given for five consecutive days, Monday through Friday, and the fee for each is $50 except for Oral Surgery which is $100. All of the courses have been approved by the Veterans Administration. The classes are limited to ten men each so that there is opportunity for discussion and personalized instruction.

Further information and applications may be secured from the Postgraduate Division of the College of Dentistry, Ohio State University, Columbus 10, Ohio.

UNIT NEWS

Missouri

On September 10th at the country home of R. M. Courtney the Missouri Unit held its annual picnic and election of officers.

The officers elected are:

President . . . . . James Jolly
Vice President . . . . . Walter Mathews
Secretary Treasurer . . . . . Earl Bean
Editor . . . . . Margaret Toalson

Three members of the Missouri S.D.C. are participating in a series of radio talks over St. Louis' WEW. The subjects will be on preventive dentistry for children.

Tennessee

The Tennessee unit was formally reorganized at the T.S.D. meeting last May. Drs. George Moss and Kimbrough Boren deserve credit for their untiring efforts.

The first program was "star-studded" with K. A. Easlick and Walter McFall.

The results of the election are as follows:

President . . . . Hiram Laws III, Chattanooga
Vice President . . . . . Gerald Bush, Knoxville
Vice President . . . Felice Petrucelli, Nashville
Vice President . . Kimbrough Boren, Memphis
Secretary-Treasurer . . A. H. Trithart, Jackson

Minnesota

Twenty-four new members have been added to the Minnesota Unit, with many new applications being received weekly. Bob Elliot writes that their first meeting was held October 18, with Dr. Harold Worman as speaker on "Some Considerations of General Anesthesia in Dentistry for Children." At the November 15th meeting, Mr. A. Roy Johnson, Ph. C., spoke on "Dental Pharmaceuticals in the Practice of Pedodontics." A large enthusiastic audience greeted both of these fine speakers, and plans were discussed to put on an all-day meeting in 1950. Keep up the good work, Gophers!

Arkansas

During the Annual State Dental Meeting last April the Arkansas Unit held its first official meeting. The total membership at that time was 42.

The election found:

J. N. Dillard . . . . . President
M. S. Nickol . . . . . Vice President
Robert Smith . . . . . Secretary-Treasurer

The programs for this fall are very attractive and should increase the membership.

Illinois

The Illinois Unit held a very interesting program at the Northwestern Dental School October 26th. Dr. Massler, who needs no introduction and Dr. Vanderveer, Chief of the Psychiatry Dept. at the University of Chicago each presented a paper on psychological problems in children specifically pertaining to the child's behavior in a dental office. After the presentations, each discussed the other's paper.

The P.M. portion of the program was a round table discussion on practice, management and economics for Pedodontics.

Nebraska

It is reported that the activity in Nebraska has reached a very high pitch under the direction of the newly inaugurated officers.

President . . . . . D. R. Ehlers
President Elect . . . . . B. L. Gainsforth
Secretary-Treasurer . . . . . Larenteutsch
Editor . . . . . H. J. Wegener

Rhode Island

In an effort to help a "budding organization," the Massachusetts Unit conducted the October 3rd meeting for R. I., S.D.C. The program consisted of case reports from:

Boston Floating Hospital—Dr. M. M. Cohen
Child. Med. Center and Harvard School of Dental Med.—Dr. P. Losch
Forsyth Dental Infirmary—Dr. N. Booth
Tufts Dental School—Dr. H. Zander

Unit news should be sent to Dr. Melvin Noonan, 141 South Bates St., Birmingham, Mich.

The Role of Dentistry in Public Health, a Report on the Seventy-Seventh Annual Meeting of the American Public Health Association

By SYLVIA E. ZAPPLER, M.D., D.D.S.
New York

Editor's Note:

Sylvia Zappler, who reports on the recent meeting of the A.P.H.A. in the accompanying article, has appeared in our pages before, covering the Cerebral Palsy Conference some months ago. She is a graduate of the Medical and Dental College, University of Vienna, and of the College of Dentistry, N.Y.U. She practiced in Vienna for many years, both as a private practitioner and a public health dentist, was Senior dentist with the New York Department of Health, and since 1947 has conducted a pedodontic practice in New York City and White Plains, New York. Besides holding office in the Women's Dental Society, she is a member of the A.S.D.C., and an indefatigable worker and investigator in the problems of pedodontics and allied dental health fields.

A.E.S.

The 77th annual meeting of the American Public Health Association held in New York City, October 24 through 28, 1949, was not only the largest gathering of public health workers, but also one of the most comprehensive ever to take place. The program, vast in its scope, covered the various phases of public health work, and those participants interested in any special subject were certainly sorry not to be able to attend different sessions at the same time for all were related in some way. The great work the A.P.H.A. has accomplished until now and the still greater work that will have to be accomplished in the future is best expressed in the words of the Hon. Paul Martin, Minister of National Health and Welfare, Ottawa, Canada, in an address delivered on "The Developing Pattern of Public Health" to a dinner session of the meeting: "We know how Public Health evolved from sporadic action against epidemics and communicable diseases to become a continuing concern for environmental sanitation and quarantine; we know how it then moved on to take account of all aspects of ill-health and to give increasing attention to preventive programs. Now that we have come so far, in the half-century ahead our goal must be nothing less than universal good health—that positive concept of total health defined in the words of the Constitution of the World Health Organization as a "state of physical, mental and social well-being and not merely the absence of disease or infirmity".

To attain that goal, dentistry must do its share. There can be no state of physical well-being as long as the individual suffers from diseased teeth or periodontal structures.

The modern trend in medicine is for prevention rather than for cure of diseases. Prevention begins with the child. Therefore, most of the sessions dealt with pediatrics, pedodontics and related subjects.

What can dentistry, particularly public health dentistry, do to free people from the scourge of dental disease?

1. They can use scientific discoveries effectively for the protection of dental health and the prevention of dental disease.

2. They can make sure that adequate dental care will be available to everyone. "No child should go without dental care because of lack of funds," says Harry Strusser, Director of the Dental Bureau of the Department of Health of New York City.

3. They can spread information about the necessity and value of dental care by using the

press, the movies, lectures to lay groups, etc.

4. They can assist in training dentists and auxiliary personnel to perform the work necessary for the maintenance of the oral health of the child.

All these thoughts were brought forth at the sessions of the dental health section of the A.P.H.A., presided over by Philip E. Blackerby, Jr., D.D.S., Director, Division of Dentistry, W. K. Kellogg Foundation, Battle Creek, Mich. The sessions were attended by large audiences, proof of the great interest the public health worker has in dental problems.

The first session was devoted to Research in the Dental Field of Public Health. David B. Ast, D.D.S., Chief of the Dental Health Section, New York State Department of Health, in his quiet and matter-of-fact manner, gave an impressive report on the "Dental Findings in the Fluorination Project at Newburgh and Kingston, N. Y." The paper was written in collaboration with Sydney B. Finn and Isabel McCaffery. The project was started in 1944. In Newburgh 1/1000 to 1.2/000 of sodium fluoride was added to the public water supply. Kingston, a town 30 miles away from Newburgh, served as control. Its public water was comparably free from fluorine. Over a period of 3 years approximately 3400 Newburgh school children from 6 to 12 years of age received periodic dental examination. The results were compared with the examinations of 2800 school children in Kingston. The study showed that the number of permanent teeth found to be decayed, missing or filled, decreased from 21 to 14.8% in Newburgh. This represents a decrease in the D.M.F. rate of 30%. The younger age group was found to have benefitted most. There was also a difference in the caries prevalence for each of the different types of permanent teeth. The reduction was greatest in the incisors (55%), in molars only 18%. At each successive examination period children in the 6 to 7 year age group showed a decrease in caries incidence in the first permanent molars. This suggests, Dr. Ast said, that there may also be some benefit from exposure to fluorine in the period between completion of the calcification of the first molars at the age of 3 and their eruption at the ages of 6 to 7. In concluding, Dr. Ast stated that "the data given were preliminary and that it will be necessary to continue collecting data for the proposed duration of the study, i.e., through 1954 to 1956 to obtain additional information concerning the caries prophylactic value of fluorine."

Edward Schlesinger, M.D., Director, Bureau of Maternal and Child Health, State Department of Health, Albany, N. Y., reported on the Pediatric Findings in the Fluorination Project at Newburgh and Kingston, N. Y. The study was undertaken in order to exclude possible toxic effects of fluorinated water on the general health of the children in Newburgh. Careful physical examinations of 500 children ages 1 to 9 were made periodically. Emphasis was laid on those signs which would be indicative of fluoride intoxication: changes in the bone, dryness of the skin, brittleness of the nails, etc. An exact medical history and laboratory tests (urinalysis, haemoglobin determination, leucocyte count, etc.) were also obtained in all cases. Roentgenograms from the right wrist and both knees were taken at annual intervals. These were read by John Gaffrey, Professor of Clinical Pediatrics, Columbia University, College of Physicians and Surgeons, New York. Some children also had ophtalmologic and otologic examinations. The findings which were compared with the results of the same examinations of Kingston children are as follows: There are "no deleterious systemic effects whatsoever from the ingestion of fluorides in drinking water in the dosage employed. But longer observations are necessary for final conclusions which should not be drawn before the termination of the ten year period."

John W. Hein, D.D.S., and Norman S. Simmons, D.D.S., reviewed the Chemical Agents in the Field of Dental Caries prevention, including those which are concerned with the alteration of the oral environment and those having an effect on the tooth itself. "The primary goal of caries research is to find a means of conferring a natural immunity to dental decay. As long as this problem is not solved, we must seek agents to control artificially dental decay." In the last few years

several chemical agents were discovered which are claimed to possess this quality. Hein reviewed the action of the most promising agents altering the oral environment: penicillin, urea, dibasic ammonium phosphate and chlorophyll. In endeavoring to change the oral environment, four points of attack are employed: 1) Reduction of cariogenic organisms; 2) dissolution of dental plaques; 3) elimination of simple sugars; 4a) reduction of acids attacking the tooth surface; 4b) counteracting the effect of those acids. Hein came to the conclusion that "all those agents are only attempts towards the artificial control of dental caries; some hold much promise, but a more basic solution is desired."

In discussing the topical application of various agents to the teeth in an attempt to reduce the incidence or severity of dental caries, Simmons said that such applications are based on theoretical concepts to be supported by observational data. While the silver ion in adequate concentration is effectively bacteriocidal, silver and undissociated silver salts as currently used in techniques are ineffective bacteriocides. The fluorides have a fourfold effect: they reduce the solubility of bone and tooth salts; inhibit glycolytic processes in bacteria and reduce the amount of acid they produce; and interfere with the digestibility of the organic matrix of the tooth. The variation in the effectiveness of the fluorides may be due to any of the following factors: Increased pH reduces the exchange of fluorides into the apatite lattice of the tooth; dehydration makes the tooth less permeable; the permeability of the organic matrix is apparently diminished with age; and the fluoride anion can be displaced by other anions if they are in high enough relative concentration.

In the same session Samuel C. Miller, Chairman of the Periodontia Department, New York University, College of Dentistry, spoke about Periodontia in Public Health. Of special interest for those of us who work with children are his statements that "practically all children show some form of gingivitis or more advanced periodontal disease" and that "most if not all cases of periodontal disease in adults had their inception in childhood." Miller mentioned also that precocious, advanced alveolar atrophy is appearing with more frequency at present. The inception of this type of periodontal disease is usually traced to two periods of stress: the period between 5 and 7 years of age when the incisors and the six year molars are principally involved, and the period between 10 and 13 years when the premolars and second molars are principally involved. Miller stressed also the fact that "brushing the teeth upon arising and before bed time is a bad carry-over from the past. The best single means for combatting caries and periodontal disease is to brush one's teeth after each meal." He concluded his report with the statement: "The recognition of early signs of periodontal disease should be taught to all public health workers and their auxiliary personnel so that they may discover aberrations at the earliest possible time with the same efficiency as in the finding of cavities. Malocclusions should be found and corrected not only from an esthetic viewpoint, but as a potent cause of disease. Early elimination of traumatic occlusion before disease has become deeply entrenched must receive as much consideration as regular prophylactic treatments."

The next session was devoted to reports on topical fluoride programs. It was reported that topical fluoride programs are run already in many states of this country, on a community basis. (Roy D. Smiley, D.D.S., Director, Division of Dental Health, State Board of Health, Indianapolis, Ind., William Kroschel, D.D.S., U. S. Public Health Service, Chicago, Ill., Margaret E. Erb, Washington, D. C., and many others reported). Leland S. Kleinschmidt, U. S. Public Health Service, Chicago, Ill., pointed out that "the reduction of new decay in teeth through topical application of sodium fluoride is a safe and painless procedure. Parents in most communities, informed by the press, radio and the dental societies about the value of this preventive procedure, are willing to put forth the necessary effort to organize their community for a dental public health program designed to reduce tooth decay."

A joint session of the dental health, maternal and child health, and school health

sections was interesting to a children's dentist for many reasons. Robert W. Culbert, M.D., Director, Bureau of School Health, New York, presented a cross-sectional study on the school physicians' clinical observations in 15,000 elementary school children under the heading "What Does the School Physician See?" Culbert mentioned that caries and periodontal disease were not included in this study. However, we learned from it that malnutrition leads with 18.9% the pathologic conditions found in these children, and that respiratory diseases are next in order with 12.3%, made up to the greatest part by hypertrophied or diseased tonsils. We all know the important role nutrition plays in the developing structures of the teeth and the periodontium, and we also know about the relationship of hypertrophied or diseased tonsils to malformations of the jaws, to gingivitis and other forms of periodontal disease.

The presentation of "A Study in the Reduction of Absences from School of Children with Ringworm of the Scalp," by Robert W. Culbert and associates, aroused my jealousy because of the fact that special classes for affected children were set up with the object of reducing forced absences from school. Children with ringworm of the scalp are not allowed to attend school because the disease is communicable. The essayist stated "While the disease is not of major clinical importance with regard to the general health of the child, it often causes prolonged serious absence from school because it is difficult to cure and does not tend to clear up spontaneously until the pupil reaches adolescence." May be that caries and periodontal disease in children are less spectacular in their clinical symptoms than ringworm of the scalp, yet they often endanger the general health of the child and do not clear up spontaneously after the pupil reaches adolescence!! The effect of neglected oral hygiene and sanitation in childhood on the general health of the individual was evidenced in the many dental cripples unfit for military service in World War II. Disregarding these facts most schools (boards of education) do not allow children to be absent from school for dental treatment. Dentists would more easily agree to treat children if they could use the less busy morning or early afternoon hours for their treatment. The children could then make up for the missed school work after the regular school hours under the supervision of a teacher who possibly could supervise several grades at a time. Thus the shortage of dentists inclined to treat children could at least to some degree be alleviated and the dental and often the general health of many children could be aided.

J. M. Wisan, D.D.S., Director, Joseph Samuels Dental Clinic for Children, Rhode Island Hospital, Providence, R. I., brought to the audience the latest information on the advances in dental research and dental health education from the annual meeting of the A.D.A. in San Francisco. He pleaded for a scientific dental treatment of children by highly skilled and trained dentists.

The last session, again a joint session of dental health, maternal and child health, medical care, and public health nursing sections, and the American School Health Association was highlighted by the reports on the findings of the American Academy of Pediatrics Study of Child Health Services. The nationwide three year study was conducted for the purpose of gathering a large body of accurate and recent facts about child health services which will serve as a guide in future extension of health services for children and "to assure preventive diagnostic and curative medical services of high quality which will make this country an ideal place for children to grow into responsible citizens." For this study the American Academy of Pediatrics was awarded the 1949 Lasker Group Award "for meritorious achievement in the field of Public Health."

The findings of the survey will be worked out in close cooperation with the American Public Health Association, U. S. Public Health Service, U. S. Children's Bureau in Washington, D. C., and the A.D.A. It will take considerable time until all the findings of the survey will be evaluated, but the first results are already available. It is confirmed that there is an urgent need for the expansion of school health services. Unfortunately space does not allow to enlarge on the medical phase of the study, and for the same reason

only some data on the extremely interesting dental findings will be reported.

John T. Fulton, D.D.S., Dental Services Advisor, Division of Research and Child Department, U. S. Children's Bureau, Washington, D. C., was the essayist for the dental phase of the survey. He underlined the great difference in availability of dental services for children in the different parts of this country, the maldistribution of dentists and the plight of dental diseases of the low income areas brought out by the study. It also reveals that each year only one out of every 50 children gets dental care in a clinic. Some states offer virtually no dental clinic service for children. Fulton continued in his report: "One of the powerful points revealed in this study is the fact that, on an average day, 96 per cent of the children receiving dental care did so in private dental offices. Furthermore, 92 percent of this care was furnished by general practitioners. From these facts we conclude that dentists in private practice are the principal sources of dental care that are available to a community population. By inference, any program which effectively improves the quality and quantity of dental care for children will have to be geared to the abilities and characteristics of the private practitioner. This being so, the section of the Academy's survey concerning the private practitioner assumes tremendous importance. Although the pertinent data relating to office practice were not reported from 2 states, it is possible to make some generalizations about the average American dentist. He is likely to be 47 years old and living in a metropolitan county. He engages in the general practice of dentistry and spends about 40 hours per week in private practice. Eighty-five percent of his services to children consist of fillings and extractions; three times as many of the former as of the latter. It is highly improbable that he has had any special training in pedodontics."

"The Academy report of the ratio of fillings to extractions and the fact that these two items constitute the bulk of the services is cause for concern. Evidence from other sources, although spotty, suggests that the average tooth decay attack rate among elementary school children is 4. Three fillings and one extraction would not seem to give children full protective value: particularly since the prime aim of public health dentistry has been to reduce the lost tooth index to zero. Besides there are other dental services necessary to the development of healthy children such as gum treatments and preventive orthodontics which apparently get little attention."

"How closely the meagerness of the service can be accounted for by the lack of training in pedodontics is a matter of speculation. A dentist 47 years old probably received very little instruction in scientific pedodontics as an undergraduate. At least the school catalogues of 20 years ago rarely mention such courses. Even today a heavy emphasis on dentistry for children is lacking in many schools. Only 9 percent of the dentists reported any postgraduate work in pedodontics, and only a tenth embraced any outside dental activities at all. Therefore, it seems possible that much of the development in dentistry for children (a fairly recent growth) is not at the fingertips of the average dental practitioner."

"The dominant and persistent fact suggested by the Pediatric study of child dental services is the need of training: both as to improving the services of the practicing dentist, and to getting more graduate dentists into the field."

Thomas E. Shaffer, M.D., Professor of Pediatrics and Education, Ohio State University, Columbus, Ohio, presented in the same session a paper on the "Joint Planning by the A.A.P. and the A.P.H.A. for the Development of School Health Services." He reported that a joint committee is at work to "translate the study results into constructive planning which would set the stage for nationwide growth of school health services . . . If a pattern could be established which would encourage joint planning between public health agencies, educators and specialists in child health at state and community levels, the future of school health would be secured."

Guttorm Toverud, Ph.D., Professor of

Pedodontia, Dental School of Norway, Oslo, delivered an address on the Dental Health Activities in Norway. The present dental health plan in Norway, according to his report, covers three main projects: 1) Systematic and free dental treatment of all children from 6 to 18 years; 2) Dental service to the rest of the population at reduced fees, fixed by the government; 3) Intensifying the preventive measures as much as possible, including the provision of grants for research. The new dental health plan which was unanimously accepted by the Norwegian Parliament will mean an enormous improvement. One of the most important changes is that dentists will be more evenly distributed between cities and rural districts.

Before concluding my report I have to mention at least one feature of the exposition connected with the meeting: The very impressive illustration of the work of the Dental Bureau of the New York City Department of Health, Harry Strusser, Director. Under the heading "Guarding Dental Health of 1 Million Children," the exposition outlined in pictures and tables "the dental health education, follow-up training and research programs in New York City." The material illustrated the model way in which the Dental Bureau in cooperation with the Department of Education takes care of the dental health of New York City's school children. In 1948-1949, 610,000 school children of New York City obtained dental care. Of these 88 percent were treated by private dentists.

Henry C. Sandler, D.M.D., Assistant Director, Dental Bureau of the Department of Health of the City of New York, gave a spectacular demonstration on the new method the Department uses in preventive orthodontics to correct crossbite of one or more anterior teeth. In 30 minutes he took the impression, constructed the splint of plastic material and cemented it in place. 500 cases have been treated by this method since the program of preventive orthodontics was started in November, 1948.

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November 1, 1949

To: Executive Council of the American Society of Dentistry for Children.

From: Ralph L. Ireland, Secretary, American Board of Pedodontics.

Subject: Report on the Activities of the American Board of Pedodontics from September, 1948, to October, 1949.

1. The American Board of Pedodontics held its first examination on February 11-12, 1949, at the School of Dentistry, Northwestern University. Thirteen candidates, who met the requirements for examination by the Board, were present for the two-day examination. The examination given by the American Board of Pedodontics covers four areas: (1) case histories; (2) clinical; (3) written; and (4) oral. Candidates are graded as "Satisfactory" or "Unsatisfactory" in each area. A candidate who is graded "unsatisfactory" in not more than two areas of the examination may, by majority vote of the Board and payment of the required fee, repeat the unsatisfactory areas at any of three subsequent examinations scheduled by the Board. Five of the above thirteen candidates were graded as "satisfactory" in all areas of the examination and were issued certificates of certification.

2. At the February, 1949, meeting of the Board, the following "Criteria for Evaluating Professional Training and Experience of Candidates" was adopted:

In order that the American Board of Pedodontics may evaluate and give due credit to a candidate's professional training and experiences in accordance with the requirements for certification, he (the candidate) shall have submitted from the school of dentistry, institution or preceptor (preceptor must be certified and further must be approved by the American Board of Pedodontics), a signed statement from the individual supervising the educational or training experiences of the candidate, outlining in detail:

1. The total time expended, with dates, of all post graduate or graduate instruction or training.
2. A detailed report of the candidate's education in respect to each of the seven areas of training listed in "Recommendations for Developing a Specialist in Pedodontics.

3. The Board authorized the printing of a booklet to contain such information about the Board as By-laws, Requirements for Certification, The Board Examination, Criteria for Evaluating Professional Training and Experience of Candidates, and Recommendations for Developing a Specialists in Pedodontics.

4. The Board re-elected the following officers for another year:

Chairman, John C. Brauer
Vice-chairman, Frank F. Lamons
Secretary-treasurer, Ralph L. Ireland

5. The next examination of the Board will be held February 2, 3, 4, 1950, at Ann Arbor, Michigan.

Sincerely yours,
Ralph L. Ireland

THE CONSTITUTION AND BY-LAWS
of the
American Society of Dentistry for Children*
THE CONSTITUTION

ARTICLE I
NAME

The name of this Society shall be THE AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN.

ARTICLE II
PURPOSE

The purpose of this Society shall be the advancement and dissemination to the profession and the public of knowledge of all phases of Dentistry for Children.

ARTICLE III
MEMBERSHIP

Section 1. Membership in this Society shall be of five classes: active, associate, student, honorary and honorary associate. Only active members may vote and hold office.

Section 2. ACTIVE membership in the Society shall be limited to members of the American and Canadian Dental Associations.

Section 3. ASSOCIATE members may be elected by the State Units or by the Society and shall be designated as those working in related fields or as dental internes in recognized institutions.

Section 4. STUDENT MEMBERSHIP: those seniors of an accredited dental school who hold student membership in the American Dental Association may be elected by the State Units or by the Society.

Section 5. HONORARY membership may be conferred by the Society on any person who has contributed in an exceptional manner to the advancement of Child Health.

Section 6. Honorary associate may be conferred by the Society on members of Foreign Societies of Dentistry for Children.

ARTICLE IV
STATE UNITS

Section 1. State Units or Societies which may be organized in conformity with the general plan and purpose of this Society shall be enrolled as component units by a majority vote of the Executive Council upon receipt of an application for affiliation. Classification of membership in component units shall be the same as that of this Society.

Section 2. State Units must have a minimum of 20 active members. Where less than 20, the members shall be considered members of the Society at large.

Section 3. State Units shall send an official delegate or representative to each annual meeting of the Society. One delegate shall be sent to represent each 50 members or fractional number thereof.

Section 4. There shall be one official state unit for each constituent of A.D.A. but each unit may have several component groups where desirable and organized under the guidance of the constituent unit. They would meet jointly as a constituent Unit at the annual state meeting.

Section 5. There shall be a meeting of the Executive Council together with the delegates representing the State Units at a time prior to the annual meeting of the Society. This meeting shall be presided over by the President-Elect. The purpose of this meeting shall be for the discussion of various matters relating to the organization, work, program, and promotion of the various functions and activities of the State Units. This body may offer such resolutions to the Executive Council or to the Society as it deems advisable.

ARTICLE V
OFFICERS

The officers of this Society shall be President, a President-Elect, a Vice-President, a Secretary-Treasurer, and an Editor.

ARTICLE VI
EXECUTIVE COUNCIL

There shall be an Executive Council, consisting of eleven members, with the authority to govern the Society in all matters between annual meetings.

ARTICLE VII
MEETING

Section 1. A regular meeting of the Society shall be held once each year at the time and place of the meeting of the American Dental Association. The exact time and place shall be specified at least three months before the annual meeting.

Section 2. Special meetings of the Society may be called; (1) by the President at the written request of twenty per cent of the active membership; (2) by the unanimous vote of the Executive Council together with a majority vote of the delegates from the State Units.

*Adopted September, 1948.

ARTICLE VIII
QUORUM

At a regularly called meeting of the Executive Council, General Business Session, or a Committee Meeting, those present shall constitute a quorum.

ARTICLE IX
OFFICIAL PUBLICATION

The Society shall publish a Journal to be known as the "Journal of Dentistry for Children." This shall be the official publication of this Society, and shall be published quarterly.

ARTICLE X
AMENDMENTS

Section 1. This constitution may be amended at any official meeting of the Society by a two-thirds majority vote of all active members present, provided a copy of such proposed change has been sent to each member at least four weeks prior to such meeting.

Section 2. Amendments may also be made at any annual meeting of the Society by the unanimous vote of all active members present and voting.

Section 3. By-laws and standing rules may be adopted, amended, or repealed at any official or annual meeting of the Society by a two-thirds majority vote of active members present and voting.

THE BY-LAWS

ARTICLE I
MEMBERSHIP

Section 1. All applications for active. associate, and student membership shall be made in writing. When submitted to the secretary and accompanied by the annual dues they shall automatically become members in the designated class.

Section 2. In States having active units, membership in the State Unit is contingent upon membership in the American Society.

Section 3. The name of a candidate for honorary membership shall be presented, with reasons therefore in writing, to the Membership Committee. The Membership Committee shall present this with their recommendations to the Executive Council, and, upon the unanimous approval of the Executive Council, the candidate's name shall be presented to the membership at the next annual meeting. The approval of two-thirds of the active members present and voting shall elect the candidate to honorary membership. Upon his election, he shall be presented a certificate of election.

Section 4. Honorary associate membership may be conferred by the Executive Council upon members of Societies of Dentistry for Children of foreign countries when such societies are organized in conformity with the general purpose of the American Society.

ARTICLE II
DUES

Section 1. Dues for active members shall be three dollars per year, payable the first day of January. Each State Unit shall pay, on or before April 1, three dollars to the Secretary-Treasurer of this Society for each active member.

Section 2. Honorary members shall not be required to pay dues, and shall be granted all the privileges of membership with the exception of voting and holding office.

Section 3. Dues for associate and student members shall be two dollars per year, payable the first day of January or through each State Unit on or before April 1.

Section 4. Dues for honorary associate members shall be two dollars per year, payable on January 1st of each year.

Section 5. Any member, not a member of a component unit, who becomes delinquent in the payment of his dues shall be notified by the Secretary at the end of sixty days. Should he continue to be delinquent for thirty days thereafter, his membership shall be declared forfeited.

Section 6. Dues of new members paid during the last quarter of the year shall apply as of January 1st following.

Section 7. A proportionate amount of dues of each paying member shall be designated by the Executive Council as a subscription to the Journal of Dentistry for Children entitling him to receive this publication.

ARTICLE III
ELECTION OF OFFICERS

Section 1. (a) All officers except the Editor shall be elected by ballot at the annual meeting, their names having been placed in nomination either by the Nominating Committee or from the floor, and shall assume office at the close of that meeting.

(b) The Editor shall be appointed by the Executive Council.

Section 2. No member of the Society shall be eligible for office who has not been a member of the Society for at least three years, this rule shall not apply to election to committees.

Section 3. No member shall hold the same office twice in succession, except the Secretary-Treasurer, and the Editor. The filling of an unexpired term shall, in this regard, be considered as a term of office.

Section 4. Permanent or temporary vacancies occurring in office between the election and the next meeting shall be filled by the President for the unexpired term of that office.

ARTICLE IV
COMMITTEES OR COMMISSIONS

Section 1. The following standing committees or commissions of five members each shall be elected by the Executive Council: Membership and State Units, Public Relations, Professional Relations, School and Dental Examining boards and Community Dental Programs. They are to be elected in the following manner: One for one year, one for two years, and one for three years, one for four years and one for five years, and thereafter one to be elected each year for five years which shall be the term of office. It shall be the duty of each standing committee to submit to the president, within four months after the annual meeting, a full report of its activities. If such report, or absence of a report, indicates that a committee is not adequately functioning, it shall be mandatory for the President to replace any or all members of such committee as circumstances may indicate necessary to activate it.

The duties of the committees shall be as follows:

Membership and State Units: To promote and build the membership of the Society; to organize new State Units and to assist State Units in their activities and the increasing of their membership. To receive all recommendations for honorary and honorary associate membership and make appropriate recommendations to the Executive Council.

Public Relations and Publicity Committee: to foster cooperation of society and lay groups organized for the promotion of child health; to give proper notices to the newspapers and other publications where publicity is desired; and to assist the proper committee of the American Dental Association in the promotion of the annual national children's dental health day; to recommend speakers for lay groups.

Professional Relations Committee: To coordinate the activities of the Society with activities of the American Academy of Pedodontics, the American Association of Orthodontics, the American Society of Pediatrics, the American Academy of Pediatrics and other medical and dental organizations which are organized for the promotion of child health; to maintain a roster of approved clinicians on pedodontics and designate suitable clinical programs for state and local dental meetings which emphasize the practice of pedodontics.

School and Dental Boards Committee: To keep a permanent record of the time and the degree of emphasis allotted to the teaching of pedodontics in the various dental colleges; to work with the Council of Dental Education of the American Dental Association in raisng the requirements and standards of pedodontic teaching with the giving of proper emphasis to this subject; to maintain liaison relations with the varous state boards of dental examiners with the view of giving pedodontics proper evaluation in examinations for licensing dentists.

Community Dental Programs Committee: To study community dental service and dental educational programs for children and set up desirable standards for such programs; to assist when possible in the formation of programs in local communities by working with the State Units when the advice and assistance of the committee is requested; to maintain liaison with the Council of Dental Health of the American Dental Association so that the Society may assist the council in the promotion of dental health.

The oldest member in point of service, of the standing committees elected by the executive council, shall serve as chairman of the committee. It shall be the duty of each chairman to present in writing a report of his committee activities to the executive council at each annual meeting.

Section 2. There shall be an Editorial and Publications Committee of three active members elected by the Executive Council: one for one year, one for two years, and one for three years, and thereafter one each year for three years which shall be the term of this office. This committee shall be in charge of the finanancing of the "Journal of Dentistry for Children" and shall act in an advisory capacity to the Editor of the Journal but shall not be responsible for the editorial policies of the Journal.

It shall be the duties of the Editorial and Publications Committee to assist and cooperate with national and state publications particularly with the help and aid of the Publications Committees of the various State Units to the end that there shall be the most widespread printing of adequate articles on Dentistry for Children; to lend their assistance to the focusing of attention to Dentistry for Children through eliciting the cooperation of all dental editors.

Section 3. The President shall be empowered to appoint such special committees as he deems needful at any time; or, on the majority vote of the members present at any meeting he shall appoint committees as they direct.

Section 4. At least thirty days prior to the annual meeting of the Society, the President shall appoint and publish the personnel of two committees: (1) A Nominating Committee composed of three members to present the list of candidates for election to office for the following: (2) An Auditing Committee composed of three members to audit the Treasurer's books.

Section 5. Within sixty days after the annual meeting of the Society, the President shall appoint a program and local arrangements committee. The duties of this committee shall be to develop the scientific program for the next annual meeting; to make the necessary local arrangements including hotel accommodations for all clinicians; to publish and mail to the membership, at least 30 days prior to the meeting, the program. The printing of the program in the Journal of Dentistry for Children shall be deemed sufficient when the publication date approximates the indicated time.

ARTICLE V
RULES OF ORDER

The Society shall be governed in all matters not covered by the Constitution and By-Laws by Robert's "Rules of Order Revised."

ARTICLE VI
DUTIES OF OFFICERS

Section 1. It shall be the duty of the President to preside at all meetings of the Society; to approve all bills for payment; sign all documents; appoint all committees not otherwise provided for; present an annual address, and perform such other duties as are customary to his office.

Section 2. The President-Elect shall arrange the program of and preside at the joint meeting of the State Unit delegates together and Executive Council.

Section 3. The Vice-President shall assume the duties of the President in his absence.

Section 4. It shall be the duty of the Secretary-Treasurer to keep a record of the transactions of the Society and of the Executive Council; to attend to all correspondence; keep all official letters received, with a copy of replies to same; to send notice to all members of time and place of meetings; to notify officers, applicants for membership committees, and others of their election or appointments; and, to keep an accurate list of members, together with their addresses.

He shall collect all monies due the Society from its members and component Societies.

At the expiration of his term of office he shall turn over to his successor all records, books, or other properties relating to his office and perform all other duties pertinent to his office.

He shall keep all monies belonging to the Society, and pay out same, provided the money is in hand, upon the presentation of a properly approved voucher.

He shall furnish a bond, at the expense of the Society, for an amount designated by the Executive Council.

He shall make an accurate report of the Society's Treasury at the annual meeting. The Secretary-Treasurer shall be paid a salary of one dollar per year.

He shall be awarded, in addition to his salary, an honorarium of three hundred dollars per year.

Section 5. The Editor shall be responsible for the publishing of "The Journal of Dentistry for Children."

ARTICLE VII
EXECUTIVE COUNCIL

Section 1. The Executive Council shall consist of the President, the President-Elect, the Vice-President, the two immediate Past Presidents, the Secretary-Treasurer, the Editor, and four other members to be elected for the first year as follows: two for one year, and two for two years. Each of these shall be replaced as his term expires by a member elected to the council for a term of two years which shall be the term of this office thereafter. The Editor shall hold his office from year to year at the pleasure of the Executive Council. The Editor shall have the power to appoint an assistant Editor, and contributing Editors for a term of one year.

Section 2. Six members of the Executive Council shall constitute a quorum, and special meetings of the council may be held at any time and place that a quorum may be gathered, each member of the council having received notification.

Section 3. The Executive Council shall conduct the business of the Society between meetings. It shall adopt the budget for the Society and approve the expenditure of the Society's money by appropriation to the various committees or other special appropriations. It shall elect such officers and committees as are specified by the By-Laws. It shall render a full and complete report of all of its actions as well as all matters brought before it to the Society and when approved by the Society becomes the action of the Society.

Section 4. The Executive Council shall select five qualified candidates for appointment to the American Board of Pedodontics. From this group, the American Board of Pedodontics shall select one to serve for a term of seven years.